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CONTENTS

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INTRODUCTION

Since Bleuler introduced his concept of schizophrenia in 1911, there has been a steady growth of clinical and experimental data relating to this disease. However, the literature dealing with early diagnosis is sparse and, as yet, there is no general agreement as to what symptomatology constitutes the early clinical picture. Older texts (Kraepelin, 1919; Bleuler, 1911) do not elaborate early diagnosis, dwelling more on distinguishing schizophrenia from other disease entities. Likewise, more recent texts tend to refer to the early stages, very briefly, in rather vague terms, implying the development of the disease over the first few years from its onset. Although practice varies, the diagnosis of schizophrenia is often reserved until Bleuler's primary symptoms of disordered volition, thinking and affect, appear overtly, by which time there may be, also, some evidence of deterioration. It is recognised, however, that these symptoms may take years to appear (Gillies, 1949), so that early diagnosis cannot readily be made by using these criteria.

There are a number of reports which deal, indirectly, with the early stages of schizophrenia, but these tend to focus on the similarity between the early stages of the disease and other, particularly neurotic, states. Such reports are prone to compare

and contrast the early stages of schizophrenia with a variety of neurotic clinical pictures and often merely emphasise the difficulty in early diagnosis, eventually labelling cases where the diagnosis is in doubt and where the disease is not established, as latent (Bleuler, 1911; Forer, 1950), pseudo-neurotic (Hoch & Polatin, 1949), abortive (Mayer, 1950), ambulatory (Zilboorg, 1956), masked (Kiesler, 1952), sub-clinical (Peterson, 1954), and borderline (Wolberg, 1952; Knight, 1953; Axel, 1955; Shenken, 1956), schizophrenia.

The approach of American psychiatrists is perhaps best represented by Bellak (1958), who states that the diagnosis of schizophrenia is essentially phenomenological, based on the degree of disturbance of ego functions and also on the pathological nature of the defences appearing in the disease. According to Bellak, the concept of the ego is best understood by reference to its functions, which include the individual's relation to reality, drive regulation, object relationships, thought processes, defences, autonomous functions, and synthetic functions. With this ego-psychological approach, Bellak describes the "borderline" schizophrenic as an individual whose thinking, affective control, perceptual reliability, and object relationships are weakened, but who does not show signs of deterioration. Bellak goes on to say, "If this same picture of dubious functioning is present, but accompanied by signs of increasing lability of mood, progressive inability of impulse control, increasing emergence of the primary

processes and increasing crumbling of the defences, with déjà vu experiences, feelings of unreality, impaired sleeping, impaired appetite and a rising anxiety level, then we are dealing with incipient schizophrenia, and steps might be taken to avoid its further progress." Here again the early clinical picture is expressed in somewhat vague and general terms. Bellak admits that symptoms, related to the breakdown of ego functions, are not specific to schizophrenia and may be present in a wide variety of other conditions.

The British approach to early diagnosis is possibly best represented by Gillies (1949, 1958), one of the few authorities who has attempted to describe the early clinical picture in a more specific manner. Gillies placed emphasis on Bleuler's primary symptoms of disordered thinking, affect and volition, and autistic withdrawal. He considered these symptoms pathognomonic, but pointed out that they may not appear overtly for a long time. Gillies' approach was to study case records for the earliest subjective complaints made by schizophrenic patients and to arrange these non-specific symptoms according to their derivation from the primary symptoms. Such symptomatic changes included vagueness in thinking, bodily preoccupations, seclusiveness, lack of interest, and a wide variety of neurotic symptoms. Gillies stressed the importance of assessing the overall picture and also the patient's attitude to his symptoms.

Some insight into how a proportion of Scottish psychiatrists

approach the diagnosis of early schizophrenia was obtained in a survey made by Timbury & Mowbray (1964). In carrying out this survey, these authors first consulted seven British textbooks in general use (Curran & Partridge, 1955; Gillies, 1958; Henderson & Gillespie, 1950; Lewis, 1950; Mayer-Gross, Slater & Roth, 1960; Skottowe, 1953; Valentine, 1955). From these seven sources an objective composite description of the diagnostic features of early schizophrenia was obtained, using the comparative matching technique described by Raven (1950). This was done by analysing the frequency with which discrete statements, about the diagnosis of schizophrenia, appeared in the above texts. By removing recurring and synonymous statements, a final list of 106 such items was obtained and these were then sorted by experienced observers until an agreed classification, under seven main headings, was reached. This list of items was then used to construct a questionnaire which was presented to members of the Royal Medico-Psychological Association in Scotland, of whom 95 (nearly 60%) responded. Analysis of the results showed that considerable differences existed between psychiatrists in the criteria used for diagnosis. The most characteristic items, which senior psychiatrists used in early diagnosis, were, briefly, vagueness in thinking, emotional blunting and incongruity of affect, lack of spontaneity in speech, preoccupations, perplexity, withdrawal and change in the experience of self. The authors of the survey concluded that the lack of uniformity in the approach to diagnosis, was partly dependent on the lack of agreed

operational definitions of the terms used.

The present thesis was derived from an initial clinical study of a few young schizophrenics who were still in the early stages of the illness. After prolonged observation in a psychotherapeutic setting, it was noted, from what the patients reported, that they were attending to stimuli in the general environment which the observer had not noticed. When the observer then paid deliberate attention to background stimuli, occurring within the compass of the interview room, there appeared to be a relation between the occurrence of irrelevant stimuli and certain behavioural changes simultaneously observable in the patient, such as thought blocking. The patients were encouraged to give subjective accounts of their experiences and, as the collection of such clinical data increased, it became clear that the patients were having great difficulty in attending and perceiving. A detailed description of some of these changes was presented in a later report (Chapman, Freeman & McGhie, 1959). In extending the clinical study, in conjunction with a psychological colleague (A. McGhie), a more systematic method of collecting the clinical data was arranged. As a result of this second study of a larger number (26) of patients, it was concluded that the earliest symptoms described by schizophrenic patients suggested that one of the primary disorders in schizophrenia is a breakdown in the selective and inhibitory functions of attention (McGhie & Chapman, 1961).

In the follow-up of young patients over a period of a few

years, the observation was confirmed that profound changes in cognitive function are subjectively experienced by schizophrenics, long before the overt appearance of signs of established disease. This led the author to continue the approach, which bears some resemblance to that described by Gillies (1958), of making a detailed assessment of the subjective complaints of schizophrenic patients. However, whereas the latter author used a retrospective study of case records, it was decided that, possibly, more detailed clinical data might be obtained in a prospective study, by interviewing patients at an early stage of their psychosis and encouraging them to describe their subjective experiences.

The aim of the present thesis then is to present clinical data, in the form of symptomatic changes in subjective experience, reported by a group of 40 schizophrenic patients, who were, in the main, studied from an early stage in the disease, and to discuss their significance and possible application to early diagnosis.

METHOD

The subjects were selected from young in-patients, initially at Gartnavel Royal Hospital, Glasgow, and later, more extensively, at Royal Dundee Liff Hospital. Patients were included in the study if the diagnosis of schizophrenia had been confirmed by the consultant psychiatrist in charge of the case, if the duration of illness did not exceed three years, and if the diagnosis was affirmed on follow-up. Thus, most of the patients examined were

still in the relatively early stages of the disease and had not yet lost the capacity to communicate their subjective experiences. A total of 40 patients co-operated in the study. Details of age, occupation, marital status, sex distribution, and duration of illness, at the time of examination, are listed in Table 1 (Appendix A). The age range was 17 to 32 years, giving a mean age of 24.6 years. Although the sex of the patient was not a criterion for selection, there was an overwhelming predominance of males in the group, only 2 patients out of the whole group of 40 being female. The duration of illness as measured from the time when the patient first became noticeably ill, varied from 1 to 33 months, the mean duration being 11 months. The majority of patients (85%) were unmarried. Every patient was examined in a short series of interviews, numbering from 2 to 12, each of which lasted approximately one hour. The interview was structured in order to provide a full clinical assessment of changes in subjective experience, collected under categories which reflected disturbances in attention, perception, memory, motility, thinking and speech. Each interview was recorded on tape and transferred later to type.

INTERVIEW TECHNIQUE

In the initial study of young schizophrenic patients, it was apparent that, although the disease was not advanced, the patients, nevertheless, had difficulty in communicating their subjective experiences and that an ordinary method of interviewing, by question

and answer, was likely to provide only a limited amount of information. It was concluded that some change in the formal aspects of communicating with the patient was necessary.

The technique, which was devised by the author, was suggested by several observations of schizophrenic behaviour. Firstly, chronic schizophrenic patients occasionally speak about themselves in the third person. Secondly, it was noted that patients, who could not communicate spontaneously in an individual interview, when observed in a small group, could talk more readily by referring to behaviour perceived in other members of the group. Occasionally a patient would engage in a monologue, which appeared to be a projection of his own experience on to another patient. Thirdly, some catatonic patients, after persistent questioning, were unable to give any account or reason for their behaviour, but when the observer imitated their motor behaviour and repeated the same question, they were often able to give rational replies. Fourthly, with less deteriorated patients in individual interviews, it was noted that the patient could describe his disturbance in motility, much more spontaneously, if he referred to movements and actions made by the observer; i.e. when the patient utilised the observer as a concrete model. Examples of this phenomenon may be found in the clinical data to be presented. Finally, a few young schizophrenics reported, spontaneously, that they could describe their difficulties, more easily, if they referred to someone apart from themselves. For example, one patient (J.O.McF. Case 25) stated,

"It would be easier if we talked of a notional third person. I could more easily understand if we described this illness on a third person. Then I could understand it. I can't understand it when it is applied to myself."

On the basis of these observations, it was decided to modify the form, as distinct from the structured content, of the interview. The patients were therefore encouraged to project their experiences and difficulties on to the examiner or an imaginary third person.

In addition, earlier observations, regarding the attentive behaviour of schizophrenic patients, suggested that communication may be improved if extraneous stimulation, in and outwith the room, were reduced. The interview was therefore conducted in a quiet setting, the patient and the observer sitting squarely face to face. The observer remained relatively immobile, avoiding irrelevant movements which had been noted previously to have a distracting effect on the patient. The observer's verbal output was kept at a minimum and the patient was allowed as much time as he wished to express himself. The patient was not discouraged or distracted from engaging in visual fixation while speaking, since it was considered that this naturally reduced his visual perceptual intake, which might otherwise interfere with his performance.

With this method of interviewing, patients who, in ordinary circumstances, may have had difficulty in providing information, could speak more spontaneously and coherently of their

experiences and the method proved fruitful in collecting clinical data which may not otherwise have been obtained. The method appeared to help the patient initiate speech activity. It was often noted that after the patient started off projecting his ideas on to a third person, as the flow of talk became more spontaneous, he would then begin to speak in the first person. An example of this projective technique may be found in the section of clinical data which deals with catatonic behaviour (P.104). The technique had the additional advantage, as a clinical research method, in that it reduced the possibility of contaminating the patient's information with statements from the observer.

CLINICAL DATA

The phenomena, to be described below, are related to different aspects of perceptual and cognitive dysfunction. The clinical data is, therefore, presented under several headings, which refer to corresponding categories of altered experience, as reported by schizophrenic patients. In order to illustrate each type of change in mental function, ten of the most coherent reports were selected from those obtained from the whole group of 40 patients. For the purposes of clarity, any relevant past work is reviewed, and each phenomenon discussed separately, in the appropriate section of clinical data presented, before proceeding to a general discussion of the data as a whole.

I. Disturbances in Visual Perception

Visual adaptation to the environment is normally achieved by the individual developing the capacity to select, from the diffuse mass of visual stimuli impinging upon him, only that information which is relevant and necessary for him to function efficiently. In this process, sensory information is automatically organised during the act of perception itself, prior to short-term storage and subsequent integration with previous learning and experience. The ability to process a great deal of information in this way, reduces the load on short-term memory and allows the individual to perceive his environment in terms of meaningful wholes. The normal adult is also able to perceive objects as being stable and constant, even though he views them from different angles or at different distances in space, regardless of whether the alteration in distance results from his own movement or the object's movement. This is referred to as visual perceptual constancy.

The following reports illustrate how visual perception may be disturbed in schizophrenia.

Case 15 (J.H.) "I was sitting listening to another person and suddenly the other person became smaller and then larger and then he seemed to get smaller again. He did not become a complete miniature. Then today with another person, I felt he was getting taller and taller. There is a brightness and clarity of outline of things around me. Last week I was with a girl and suddenly she seemed to get bigger and bigger, like a monster coming nearer and

nearer. The situation becomes threatening and I shrink back and back."

Case 29 (G.H.) "Things go too quick for my mind. Everything is too fast and too big for me - too quick to study. Things get blurred and it's like being blind. I can't make them out clearly. It's as if you were seeing one picture one minute and another picture the next. I just stop and watch my feet. If I move, everything alters every minute and I have no control over my legs. My legs are too quick for the top half of my body - it's my head that'sweak. I followed the sun and it seemed to drive me along. The sun seemed too big for me and it was coming closer. Everything else seemed to be coming closer and bigger all the time. I tried to make the air turn back. It was frightening. That was a long time ago - last year."

"Everything I see is split up. It's like a photograph that's torn in bits and put together again. If somebody moves or speaks, everything I see disappears quickly and I have to put it together again."

Case 38 (K.M.) "Sometimes people look taller and broader than they should be or else everything looks smaller as if I'm a giant in toyland. People's faces keep changing. Sometimes I can see only half a face and I have to wait until the two halves come together. Things suddenly get taller and larger."

Case 22 (C.G.) "I have to put things together in my head. If I

look at my watch I see the watch, watchstrap, face, hands and so on, then I have got to put them together to get it into one piece."

This appeared to apply to this patient's perception of memory images as well as the external environment. For example, he stated, "I have to build up a picture of someone. If something interrupts me, the picture is not finished. You did it just now. You spoke while I was building up the picture. I was trying to hold on to it and listen to you at the same time. I lost it. You spoke and it faded away."

Case 12 (F.A.K.) "My vision doesn't focus right. I have to look hard at things before I can understand them. I see everything like pictures building one on top of the other like projection, one frame after the other and they are going too fast for me to see. It didn't start like that. When I was still at work, my eyes got drawn away by things. I used to look at the metal shavings on the bench. Things like that could take all my attention because they looked as fascinating and priceless as the Mona Lisa."

Case 25 (J.O.McF.) "I see things flat. Whenever there is a sudden change I see it flat. That's why I'm reluctant to go forward. It's as if there were a wall there and I would walk into it. There's no depth but if I take time to look at things I can pick out the pieces like a jigsaw puzzle, then I know what the wall is made of. Moving is like a motion picture. If you move, the picture in front of you changes. The rate of change in the picture

depends on the speed of walking. If you run you receive the signals at a faster rate. The picture I see is literally made up of hundreds of pieces. Until I see into things I don't know what distance they are away."

Case 35 (A.A.) "I see colours much brighter than they used to be. When I look at something now, say a tree, it seems much newer and brighter. If I see something moving it seems to be coming too fast. Things move too fast for me to follow. When people walk about, their actions seem to be speeded up."

Case 3 (T.McL.) "Things sometimes alter in size, light and shade when I'm coming out of the drowsy spell. It seems to be that people are putting me to sleep and they want that to happen - causing things to alter in size and shape. They want to do something with my mind. Everything gets taken from me - feel a heaviness in the mind. When I come to everything is put back in its proper perspective."

Case 9 (J.D.) "Things around me look more attractive now. Colours seem to stand out more and everything is more meaningful for me. It's as if I were seeing things for the first time."

Case 17 (J.O.M.) "Everything seems to be a lot different. Things don't seem natural to me - my eyes have gone funny. When I go outside, people seem to be walking up and down and then they all start floating about."

It would appear from these reports, that schizophrenic patients experience, from time to time, transient but severe disturbances in visual perception. At these times, perceptual stability appears to be lost and the patients are unable to reduce, organise and interpret visual information in a normal fashion. The patient's attention is diverted to inspection of different parts of a whole, instead of being free to interpret and assimilate the whole itself. As illustrated in some of the reports (Cases 29, 38, 22, 12, 25, 35) this may mean that they are unable to interpret the whole, as a meaningful gestalt, until they have taken sufficient time to co-ordinate its different elements, and this has to be done in a conscious deliberate fashion. As illustrated in two reports Cases 29, 22), this latter activity may be interrupted by auditory or other visual stimuli occurring in the environment, thus delaying recognition of the initial stimulus. Also, the alteration in visual perception relates, not only to the external environment, but also to the conjuring up of visual images, a phenomenon which Critchley (1953) terms defective revisualisation. There also appears to be an intricate relationship between disturbance in visual perception and motility, but this will be discussed in more detail in another part of the thesis.

This difficulty in visual perception is closely related to other perceptual deficiencies which will be discussed below. However, it may be stated briefly at this point, that some schizophrenic patients, in order to perceive their environment accurately,

require to retain, for so long in consciousness, so much detail, which normally would have been dealt with automatically, that the function of short-term memory becomes subject to overloading and vulnerable to distraction by stimuli irrelevant to the task in hand. The defect also arouses a great deal of uncertainty in the mind of the patient which impairs his general performance, but this aspect will be dealt with elsewhere in the thesis.

Thus, the phenomena, experienced by schizophrenic patients, include alterations in the size, distance and shape of objects (metamorphopsia), alterations in colour or brightness/contrast, loss of stereoscopic vision, defective revisualisation, and illusory acceleration of moving objects. Similar phenomena are known to occur with organic disease of the parietal lobes (Critchley, 1953) and some of them, also, as ictal phenomena in temporal lobe epilepsy (Penfield & Jasper, 1954; Lennox, 1960). Investigation of these phenomena in schizophrenia has begun only in recent years and has been experimental rather than clinical. The results from the experiments carried out so far confirm that there is a reduction in size, shape and distance constancy in schizophrenia (Crookes, 1957; Weckowicz et al, 1957, 1958, 1964; Hamilton, 1963). These experimental studies have been carried further to demonstrate a positive correlation between disturbed visual perceptual constancy and abnormal concept formation (Weckowicz & Blewett, 1959). The latter workers, concluded from their investigations, that both of these anomalies were secondary to an impairment in selective

attention, and that this deficiency was more marked, the more malignant the illness. Chapman & McGhie (1962) came to the same conclusions, regarding attentive behaviour in this disease, after conducting a series of experimental investigations of the effect of distraction, on the performance of schizophrenic and other psychotic patients.

So far, there has been no attempt at a clinical correlation of disturbances in visual perception and the course of the illness. Although this is not the main purpose of this thesis, it will be shown below, that there is a distinct tendency for the illness to take a malignant course in those patients who report experiencing such phenomena at an early stage.

II. Blocking Phenomena

Bleuler (1911) stated that the Kraepelinian concept of blocking was of fundamental significance in the symptomatology and diagnosis of schizophrenia. This view has since been endorsed in some of the literature on schizophrenia, but the concept appears to have become limited to the sudden occurrence of stoppages in the flow of thinking. The phenomenon, so defined, has been likened to petit mal epileptic seizures (Mayer-Gross, Slater & Roth, 1960) and has also been considered to be unrelated to any environmental influences (Henderson & Gillespie, 1962). This narrowing of the concept to sudden pauses in thinking is not wholly in accord with Bleuler's original observations on this particular feature of

schizophrenia. Bleuler described how the phenomenon could develop rapidly, in a 'capricious' manner, and occur in transitory episodes of varying duration, with blocking not only of the stream of thought but sometimes of the entire psyche, involving the processes of attention, perception, memory, speech and motility. Although he noted that attention could be blocked, Bleuler did not appear to link this phenomenon with the disorder of attention which he also described. Bleuler observed episodic changes in the selective and inhibitory functions of attention, so that at times the schizophrenic appeared to be bombarded by sensory stimuli from the environment and he noted that - "almost everything is recorded that reaches the senses", while at other times the opposite conditions prevailed, the patient exhibiting short periods of inattention in which - "the most powerful stimuli are incapable of influencing their train of thought or of arousing their attention." Bleuler considered that both the blocking phenomenon and the disturbance in selective attention were largely dependent on an underlying disturbance in association, and did not attribute any significance to environmental stimulation in the development of blocking episodes, despite the fact that in at least one case that he mentioned, he found that blocking could be induced by insistent questioning of the patient and could be circumvented if such interrogation were avoided.

As mentioned in the introduction, earlier clinical observations had suggested that possibly environmental stimulation exerted some influence in the development of blocking phenomena and

that also there may be a link between the disturbance of selective attention and the episodic changes in mental function reported by schizophrenic patients. This question will be discussed after presenting a number of subjective accounts of 'blank' spells reported by schizophrenic patients. In view of a certain degree of similarity between this phenomenon in schizophrenia and focal epileptic seizures, it was decided to obtain also, subjective accounts of the latter from temporal lobe epileptic patients. Some essential details of the epileptic patients, included in the study, are summarised in Table 2 (Appendix B).

(A) Subjective Experiences: Schizophrenic Patients

The changes in subjective experience now to be reported were most often described by the patients as 'trances', but different patients referred to 'blank spells', 'attacks', 'stoppages of the mind', 'dazes', etc. The frequency and duration of the phenomenon varied with the individual patient, but in most cases it occurred several times every day and many patients said that they had experienced these changes on a countless number of occasions.

Case 10 (A.McD.) "It's like a temporary blackout - with my brain not working properly - like being in a vacuum. I just get cut off from outside things and go into another world. This happens when the tension starts to mount until it bursts in my brain. It has to do with what is going on around me - taking in too much of my

surroundings - vital not to miss anything. I can't shut things out of my mind and everything closes in on me. It stops me thinking and then the mind goes a blank and everything gets switched off. I can't pick things up to memorise because I am absorbing everything around me and take in too much so that I can't retain anything for any length of time - only a few seconds, and I can't do simple habits like walking or cleaning my teeth. I have to use all my mind to do these things and sometimes I find myself moving and doing things without knowing it and I'm not controlling it. When this starts I find myself having to use tremendous control to direct my feet and force myself round a corner as if I'm on a bicycle. I want to move and the message goes from my brain down to my legs and they will not move the right way. What I'm worried about is that I might get myself so controlled that I will cease to be a person. I find it difficult to cope with these situations that get out of control and I can't differentiate myself from other people when this comes on. I can't control what's coming in and it stops me thinking with the mind a blank."

Case 25 (J.O.McF.) "I don't like dividing my attention at any time because it leads to confusion and I don't know where I am or who I am. When this starts I just go into a trance and I just turn off all my senses and I don't see anything and I don't hear anything. Things going on around me don't affect me but when I come out of it all these things are turned on again. If I have to think a lot

about everything I'm seeing around me and carry on a conversation at the same time, then the blank spell will come on and might be longer. It affects my actions as well. It's all right if it's just one thing at a time but I am virtually blind at these times and can't move properly because there are so many things coming into my eyes that I don't know what's what. I'm like a robot that somebody else can work but I can't work myself. I know what to do but I can't do it. When I'm in this state of confusion I can't relate past experience to what is happening now. I can't keep things in mind long enough."

Case 15 (J.H.) "At times there is nothing to hold the mind and this is when I go into a trance. When the mind stops receiving messages from things around me I don't react to anything that happens. When coming out of a trance something must disturb me to waken me out of it for you don't recover straight away. You tend to linger in these trances and your mind goes dead to the world around you. You can very easily go into a trance - it goes on as soon as the mind stops and then you realise you are not actually seeing anything or hearing anything. It's a delight - you don't feel anxious until you come out of it. When you're in it, you tend to withdraw all your interest from everything around you. It's a condition of unity and I return from this unity and say - "Oh Heavens, where was I there?" The trance worries you obviously if you want to jump on a bus because you might move the

wrong way. It's when you return and find yourself in union with something specific that you start to worry. I might be coming out of a trance and realise that I'm not sure where my feet are going. It takes time to wear off but until it does I can't do the simplest tasks."

This patient was able to describe more clearly than any of the others in the study, an impairment of identity experienced during each episode, if he happened to be looking at another person.

"When you feel in a trance, you tend to identify yourself with the other person, but that does not matter for if he moves you go back into a trance. You are dying from moment to moment and living from moment to moment and you're different each time. You don't know you're in it. When I look at somebody my own personality is in danger. I am undergoing a transformation and myself is beginning to disappear."

Case 32 (A.H.) "I get less and less conscious of what people are saying and my senses withdraw completely. My mind just comes to a stop and then I don't pay attention to anything. I don't want to go into a trance for I am nothing if I haven't got contact with the outside world. People disturb me in bringing this on by stopping and talking. I get a terrible excitement with butterflies, and all hot, and then everything flashes with emotion in your ears and eyes and everywhere. At these times when I go into a trance, everything in the past, all my experiences, knowledge, everything I have learned, things that should have been put to me at the time

in dealing with the situation, are not there. I don't have the ability at the time to use it. Everything goes and afterwards you can think about it."

"Everything just sort of blacks out but sometimes I can just manage to keep above the surface. I start off with my faculties intact and then something interferes with them and I find I've got less to draw on. There's less mind there and my personality scatters. There must be a certain level of consciousness for doing things and with me it becomes less. If I go any lower I won't be a person at all, just a beast."

"I fall away in concentration and a simple act like walking, peddling a cycle or talking becomes impossible. Simple things like walking a street can be deadly. People do things automatically without thinking. I look at my legs and wonder where I'm going to get the energy to move my legs. My legs start to wobble. How do I know my legs are going to move when I want them to? I just stop. All the background becomes one thing and if I'm not paying attention people suddenly appear from nowhere."

Case 12 (F.A.K.) "My mind goes blank when I listen to somebody speaking to me - telling me a story, and my eyes just stare and I'm not aware of anything. It happens when I'm watching television as well and my concentration drifts away and focuses on any point in the room and I can't pick up anything that is going on. I go into a daze because I can't concentrate long enough to keep up the conversation

and something lifts up inside my head and puts me into a trance or something but I always wake up later." (How does it start?) "I get shaky in the knees and my chest is like a mountain in front of me, and my body actions are different. The arms and legs are apart and away from me and they go on their own. That's when I feel I am the other person and copy their movements, or else stop and stand like a statue. I have to stop to find out whether my hand is in my pocket or not. I'm frightened to move or turn my head. Sometimes the legs walk on by themselves or sometimes I let my arms roll to see where they will land. After I sit down my head clears again but I don't remember what happened when I was in the daze."

Case 17 (J.O.M.) "If I look at a person in the face I feel my body and mind slipping away from me. There's too much comes into my mind so that I don't know what is going on and what I am doing. I can't hold on to thoughts because too many thoughts come into my head and I can't hold them long enough to sort them out. I just give in and stare at the picture on television or something. I can see the picture but I don't take it in and I can hear people speaking but I cannot make out what they are saying. I just sit in a trance and if my mother says anything to me, I do not do anything but maybe ten minutes later I come out of my trance and I ask her what she said."

Case 34 (G.R.) "The excitement builds up within me when I think

of two things at once and I get all mixed up and get into a daze and I can't control my actions. While I'm in the daze I don't care about anything but afterwards I do care, just gazing into space as if I'm lost, not thinking of anything. I have no interest in what I'm doing. I would be sort of tense if somebody spoke to me because it's a shock at the moment. I wonder later what the other workmen are thinking about me, what I'm doing. I might be doing something stupid. My mind's a blank and if they are talking to me I'm not picking up their conversation - it's just a background noise. Then my eyes pick up the nearest object and stick to it - I am motionless, might last a few seconds. It's just like a short spell of sleep. It's after your mind goes a blank that you start to worry. If your mind is empty something happens and the noise breaks you out of your blank mind. You're not sure what the noise is. It's the same shock if somebody moves suddenly."

Case 21 (J.Y.) "I get spells where I seem to be in a sort of trance. Something happens in my head as if my brain is getting squeezed and I get awfully nervous. I usually try to sit down or find something to look at but I'm not really seeing anything and if people talk to me it's all going in a deaf ear and they are just wasting their time. I'm frightened to move and I don't pay attention to anything else. It's something that builds up and if I try to move I feel awkward as if my legs will go the wrong way. I feel that my head is just plopped on my shoulders and I have not got full

control over my arms and legs. I've had these things a thousand times now. I know I'm likely to wake up again but each time I get frightened and think that something is going to happen."

Case 29 (G.H.) "Nothing settles in my mind - not even for a second. It just comes in and then it's out. My mind goes away - too many things come into my head at once and I lose control. I get afraid of walking when this happens. My feet just walk away from me and I've no control over myself. I feel my body breaking up into bits. I get all mixed up so that I don't know myself. I feel like more than one person when this happens. I'm falling apart into bits. My mind is not right if I walk and speak. It's better to stay still and not say a word. I'm frightened to say a word in case everything goes fleeing from me so that there's nothing in my mind. It puts me into a trance that's worse than death. There's a kind of hypnotism going on."

Case 13 (C.M.) "My mind goes a blank and I can't concentrate on anything. There's a pressure starts in the right side of my brain that makes me dizzy. My legs go funny and my body feels different. It gives me a fear of disintegrating completely. I can't cope with the smallest thing. The whole vision goes out so that I can't see - at least I don't see what is going on. My hearing goes off too. I can still hear things but it's just a hum of noise."

(B) Clinical Observations

Apart from data and subjective reports obtained initially at interview, this type of change in attentive behaviour in young schizophrenics could be observed directly. It was noted that when the phenomenon did occur, it appeared to develop in a certain way which will now be described and which apart from duration, appeared to be strikingly the same for different patients.

At the beginning of the interview the patient may be listening attentively or speaking relatively coherently. Then, if the observer talks a great deal, and particularly if the communication is abstract, the patient may become confused and so distracted by environmental events, that he is unable to maintain any one line of thought and communication begins rapidly to break down. When this occurs, the patient loses his initial composure and appears to become increasingly alert. This change is nearly always accompanied by manifest anxiety and tension. Then there is often a slight but nevertheless perceptible increase in the pressure of the patient's talk. The patient nearly always continues or initiates talk at this point and shows a more noticeable break up in his thinking. It appears also characteristic of this stage, that extraneous or irrelevant items or environmental events (e.g. a movement of the observer, a noise, etc.) tend to intrude into the patient's thought content. As this distractibility increases, if the patient is still speaking, there comes a sudden cessation in the flow of his talk. If, on the other hand, the observer were speaking, the patient

appears to have increasing difficulty in following the conversation and after producing a few echolalic responses, appears suddenly to cease to attend to what is being said. The duration of any episode of inattention could be timed and it varied with different patients and at different times with the same patient. In most cases, within the first two years of the illness, it usually ranged from a few seconds to one or two minutes, but in those patients who had been ill for longer, and in patients with additional catatonic symptoms, the episodes sometimes lasted for two to three hours.

During the episode the patient does not move, speak, or respond to verbal stimulation. Eye blinking is either infrequent or absent and the patient looks fixedly at some point in the room, usually the floor. The observer may deliberately introduce new stimuli at this stage, such as questions, noises, movements, etc., but the patient fails to attend to them.

Sometimes recovery from the episode seems to occur spontaneously, but at other times it appears to be coincident, in time, with some new and sudden stimulus, such as a loud noise or a sudden movement by the observer. The patient then starts to pay attention again, but at this stage he shows difficulty in localising any sounds and appears perplexed. Also at this stage he appears to be very hazy concerning events which had occurred prior to the blocking. He often fails to recall what the examiner has been saying, or else, with great difficulty and deliberation, he may respond with a patchy recollection of the general line of conversation or else he might

repeat a few words of what has been said. If the patient himself had been speaking when the episode occurred, he had the same difficulty in recalling what he had said.

(C) <u>Epileptic Patients</u>

Case 6 (I.S.) "I have two kinds of turns, light and deep, but they usually start the same way. My body seems to seize up, like getting a fright. Then I feel something behind my left eye and sometimes that side of my face feels hotter. Something seems to happen to the left side of my body. I just feel tight and this frightening feeling shoots right down to my stomach. At one minute I could be speaking to you and suddenly this feeling comes on me like a jump. It does not last any great length of time, but it slows up my concentration a little. If I keep looking at a single object when the attack is on, I find that looking at that particular object, the chances are that it will last a lot longer, but if I get the feeling and I know it's coming on and I switch my attention to something else, it goes away. If I look away or turn my head I can come round faster. The deep turns start much the same way as the light turns, except something else happens. My concentration disappears altogether and I stop wherever I am. My sight, hearing and movements are all cut out and I stop dead wherever I am as soon as this concentration disappears. I'm completely dead to everything going on around me - everything is cut off like taking an anaesthetic. Then I gradually come back to myself and feel a bit stupid about it."

Case 5 (M.R.) "It starts with feeling something in my stomach, like a rumbling, and then it spreads up over my head. I feel it coming over me and then I black out and I'm not aware of anything else. It's so quick I don't have time to do anything. I stop speaking and lose the power of everything but it's only for a few seconds and then I carry on."

Case 2 (A.M.) "It starts with a funny feeling in the bottom of my stomach and it passes up to the top of my head and there's a ringing noise through my ears. Then I get dizzy and go into a daze for about half a minute. I might be doing something and then my mind wanders and I might do something else subconsciously and later just say to myself, what was I doing before, and go back to it."

Case 1 (E.L.) "I get a warning - a feeling of something on this (left) side of my face and both ears fill up with a terrible noise so that I can't hear anything else. I'm lost to the world but I seem to be all right crossing the street. I know when a motor is coming but I would never know if a person is speaking to me or who the person is. If you or any of my neighbours were passing me I wouldn't know, and whether I'm speaking myself or smiling to them I wouldn't know. I can see figures but I can't recognise them and I wouldn't know what they are saying." (You say you can carry on walking during a fit?) "Yes, and I seem to end up at the right place but I don't know how I get there and I don't know what's been going on when I go like that."

Case 7 (I.C.) "I don't hear anybody speaking and my eyes are flashing so that I don't see things clearly or hear anything until I come out of it. I don't know what's happening when I'm in this turn and I usually don't know I have had it until I find I have wet myself. If somebody touched me I come out of it quicker. Sometimes it lasts longer and I do things I don't know I'm doing at the time - like going into another room or up the stairs. It starts with a numb feeling in my right arm then I get flashing in front of my eyes and a noise like wind blowing in my ears. At the same time I get a feeling in my stomach as if it was being scraped out. Then my mind goes blank but I don't fall."

Case 3 (G.P.) "It's a faraway feeling. It's just a kind of sleepiness. When it's finished I take note of my surroundings and the parties around me. Then I ask somebody if I had taken a fit. Sometimes I get this feeling and I don't take a fit. I waken up and come to myselfcorrectly. I don't realise any space of time and I just carry on as usual."

The above clinical data suggests that schizophrenic patients suffer from paroxysmal episodes of dissolution in mental function in which their perceptual and cognitive processes are profoundly disturbed. Although brief in duration, these changes appear to be very complicated. It would appear that at one moment the patient's consciousness may be flooded with an excess of sensory

data, different items of which appear to compete for retention in short-term memory in order to be assimilated. Then within a brief space of time the same patient may find himself almost completely insulated from sensory experience. The phenomenon appears to build up through stages which are characterised by increasing distractibility and impairment in short-term memory, progressive impairment in communication, severe disruption of body image and motility, together with impairment of identity, to reach an end point in the actual blocking itself. It is perhaps not surprising that the patients speak of "going into" and "coming out of" such episodes, because the blocking does not occur instantaneously and the whole phenomenon takes a certain time to develop. Some of the reports (e.g. Cases 10, 25, 32, 12) suggest that environmental stimulation plays a part in the development of this phenomenon, although internal stimulation, in the form of crowding of thoughts, appears also to be important (Cases 17 and 29).

It may be important to note that the patient is to some extent aware of the disrupting process as it develops and his subjective experience of his body "breaking up into bits", and the impairment of identity, which the patient tends to interpret as an impending death of the self, are associated with very intense anxiety. The fact that the patient may have had the same experiences many times before does not appear to alleviate this affective reaction, each time the phenomenon occurs in the first few years of the illness. The patient knows that he will probably "come out of it" intact but the experience, each time, is for him a real event. It was also noted that

frequently, although the patient may have had initial difficulty in recalling sensory events which had occurred just prior to the block, if the observer persisted in questioning the patient, the latter could sometimes produce the gist of what had occurred. At any rate, it would seem that the patient experiences the effects associated with the phenomenon, in such a state of consciousness, that he can recall most of them. During the build up of the episode the patient appears to be unable to discriminate between sensory impressions, so that a stimulus in one sensory modality tends to be fused with a stimulus perceived in a different modality. When blocking does occur, there appears to be a tendency for this to be prolonged until the patient is "wakened out of it" by a new stimulus. Thus, one of the schizophrenic patient's main difficulties seems to be in regulating and organising sensory intake so that it is kept at the optimal required for assimilation at a given time. It would appear that this balance can sometimes be achieved but is readily lost, so that in effect, there is a continuous waxing and waning on either extreme of this optimum.

It is tempting to compare these blocking phenomena in schizophrenia with the alterations in consciousness which occur in epilepsy. The resemblance to petit mal seizures seems to be superficial. Petit mal attacks appear to be more abrupt in onset, shorter in duration, and characterised by a more rapid shut-down of perception and cognition. There is, perhaps, a slightly greater degree of resemblance to temporal lobe seizures in that the latter are slower to build up in time and may be associated with a variety

of 'positive' symptoms of perceptual disturbance, such as illusions and hallucinations. However, there do not appear to be any reports in the literature of epilepsy (e.g. Penfield & Jasper, 1954: Slater, Beard & Glithero, 1963; Karagulla & Robertson, 1955; Lennox, 1960;: Marchand & De Ajuriaguerra, 1948), which describe the occurrence of phenomena as described above for schizophrenic patients. In addition, study of the small number of temporal lobe epileptic patients in the present investigation has failed to reveal the presence of such phenomena. Certainly, thought blocking, defined simply as a sudden pause in thinking, is known to occur in epilepsy, including the psychoses associated with temporal lobe epilepsy (Slater, et al, 1963), but as suggested above, this latter symptom in schizophrenia is only one aspect of a very complex series of changes which may occur within a very brief space of time. Although temporal lobe epileptic patients may produce symptoms of disturbed body image and motility, they do not appear to experience these disturbances with the same degree of severity as schizophrenic patients. Another point of difference appears to be that in the build up of these phenomena, before the block occurs, the schizophrenic has particular difficulty in co-ordinating motor sequences in order to carry out simple actions, the nature of which he understands; in other words, ideokinetic dyspraxia. Further, although temporal lobe epileptic patients may, at times, feel detached from their own personalities, or express delusions of identity, they do not appear to suffer the same transient confusions of identity, described in more detail below, that schizophrenic patients experience during

these episodes of mental disintegration. Finally, the schizophrenic patient appears to be more able to register and recall the profound changes experienced when the phenomenon occurs, although as in temporal lobe epilepsy, both of these functions appear to be impaired, in schizophrenia, perhaps to a lesser degree. Details of this clinical comparison between schizophrenia and epilepsy are illustrated in Table 3 (Appendix C).

In conclusion, this peculiar phenomenon in schizophrenia, although bearing some resemblance to temporal lobe seizures, is not indistinguishable from the latter. However, both conditions appear to have a common denominator in terms of a paroxysmal impairment in consciousness. Consciousness has been said to depend, largely, upon the inter-relationship between the neural basis of the body schema and the perceptual organisation of the environment, and also upon the capacity for memory storage of sensory data and the availability (recall) of stored information (Brain, 1963; Sherwood, 1957). Sherwood (1957) states - "Consciousness is thus a function of the volume of information which can be continuously and simultaneously processed." As was illustrated above, in relation to disturbed visual perception, and as will be further illustrated with other clinical data, yet to be presented, the breakdown in perceptual functioning results in an increase in the volume of information which the schizophrenic has to deal with, but is unable to process, and at times this may reach such a peak that consciousness is disturbed.

III. Disturbances in Speech Production.

There have been many studies of the disturbed communication which is recognised to be one of the cardinal features of this disease. Different approaches, neurological, psychoanalytical, and experimental psychological, have emphasised one or other aspect of the physiological and psychical process which governs thinking and language behaviour. Such past studies have been dealt with recently by Payne (1961) and Fish (1962). Although thinking and speech are interdependent, in recent years the trend has been to swing away from straightforward clinical study of schizophrenic speech and to approach the problem by direct experimental investigation of different aspects of schizophrenic thought disorder. Since many of these studies of schizophrenic thinking have led various workers to postulate a breakdown in the mechanism of selective attention in schizophrenia, they will not be mentioned here but will be incorporated in the general discussion. Possibly, as the findings from the growing variety of experiments accumulate and become co-ordinated, we will achieve a better understanding of the mechanisms underlying schizophrenic thought disorder. At present, however, there still appears to be room for clinical study of the formal aspects of schizophrenic speech, especially in the early stages of the disease, before deterioration occurs.

Two studies, which may be mentioned at this point, refer to the controversy which prevails concerning the abstract-concrete dichotomy in schizophrenic language. Goldstein (1939) described

an impairment in abstract attitude, so that the schizophrenic's thinking and speech become more concrete. In contrast, Cameron (1938, 1939) described schizophrenic thinking as being 'overinclusive'. Overinclusion was defined as an inability to preserve conceptual boundaries, so that irrelevant items become incorporated in concepts, rendering the patient's thinking less precise and more abstract.

Clinical observation of young patients suggests that the disturbance in the schizophrenic's thinking and speech varies, in severity, with the degree to which his perceptual system and short-term memory are over-loaded with sensory information. This dynamic fluctuation in cognitive function, which may occur within a very brief space of time, has been mentioned in the section dealing with blocking phenomena. The present section of clinical data deals with the disturbances of speech production, which have been found to be associated with these paroxysmal episodes of mental disintegration in schizophrenic patients.

It was of considerable interest that a number of temporal lobe epileptic patients, in the study, produced reports which contain some similarities and differences, when compared with the reports of the schizophrenic patients. The paroxysmal disturbances of speech occurring in temporal lobe epilepsy have been reported, in some detail, by Serafetinides & Falconer (1963). However, it may be worth while presenting a few typical descriptions of the difficulties, in expressing their thoughts, reported by temporal lobe epileptic

patients, in order to compare them later with schizophrenics.

(A) Schizophrenic Patients

Case 22 (C.G.) "Often I have to go through two or three things in my head before I find the thought I want - words I don't want come out - not the correct words - not the words I wanted for the meaning I wanted to give. I have to pick out thoughts and put them together. I can't control the actual thoughts I want. I can't compare it with my speech. I think something but I say it different. Thoughts just come out - all kinds of things come out together. People listening might hear something different from what I mean. Sometimes I do not say anything because of this. I keep the words in me. Yesterday a chap came along and spoke to me. I knew what I wanted to say back. I had the impression of what I wanted to say in speech but I couldn't get the words I needed - words that weren't correct came out. I could not get the words that were correct to make up a sentence and I knew I was not saying the right thing. I listen to everything I say and I don't like to say something and not hear it myself. I like to remember everything I say to somebody and make sure it's correct."

Case 36 (J.McD.) "I am not conscious about what I have been speaking about. Other people might think I am not speaking any sense. I have to recheck it, but many a time it's just that quick, that if I was speaking, my mind goes a blank and I say the wrong words. My mind has gone blank many times and I have to take time to get the

speaking right. You get your subconscious speaking differently to you. When I am speaking words just go back through the subconscious and irritate the subconscious and words go out that are sometimes the wrong words. Sometimes it's the right word but if it's the wrong word I have to check it. I keep it in - just not let it out. Sometimes I don't get time to check it and I just have to say it."

Case 29 (G.H.) "My mind isn't right if I walk about and speak - it just depends; it's not all the time. My mind is clear today. People speak too quick for me to understand. My own words break them up. My own words mix into them. When I'm going to say something, something else just comes into my head before I can speak and I'm frightened I might say the wrong thing. It's better to stay still and not say anything. Words are coming out of my mouth that shouldn't come out and they come back on me and mix me up. I still hear the words ringing in my ears after I've spoken the words. It's like listening to the wireless. There is a different speech in me. Every time I say a word, it seems to put a strain on everything. It's all right if it is the right word, but if it's the wrong word it's balmy. It seems to go both ways and comes out in two different ways. I'm fighting against something inside myself that affects my speech - it's something terrible, it's a different language that I can't get rid of."

Case 32 (A.H.) "When I am listening to people I am getting on all right until I have to start talking. I am afraid I will not be clear

and lucid. I have got to keep a part of me watching the rest of myself to make sure nothing goes wrong. I feel as if I am always talking to another bit of myself. Sometimes it thinks itself wiser than I and cuts me off from myself. I have the words and I can write them down, but when it comes to saying it, something happens and I steam up completely. I can't get hold of the word - it runs away the more you run after it."

"The things in my mind I simply can't get across. It needs a smooth flow from your mind and I haven't got this. I wish I could talk without interruption - not from you, from inside myself. I have a certain line of thought and something interrupts it and then I lose the line of thought I was on." (What interrupts?) "I can't say what it was that interrupted - it runs away from me when I try to get it. Sometimes it's a daft idea, or just a word. There's a physical thing which prevents me from expressing myself. I can write my thoughts down better than say them because it flows freer and can be corrected later. I am not so immediately responsible for it when I write. I am on a single line just now - my mind running on one track just now but at times your consciousness extends further into this eerie world. It does this effortlessly all by itself and then I have to try and arrange my thoughts - separate them out and put them in front of me. I have to look at them even though they are buzzing about everywhere or else I have to give them a kick to hurry them on."

Case 12 (F.A.K.) "The worst thing has been my face and my speech. The words wouldn't come out right. I know how to explain myself but the way it comes out of my mouth isn't right. My thoughts run too fast and I can't stop the train at the right point to make them go the right way. Big magnified thoughts come into my head when I am speaking and put away the words I wanted to say, and make me stray away from what was in my mind. Things I am speaking just fade away and my head gets very heavy and I can't place what I wanted to say. I've got a lot to say but I can't focus the words to come out so they come out jumbled up. A barrier inside my head stops me from speaking properly and the mind goes blank. I try to concentrate but nothing comes out. Sometimes I find a word to replace what I wanted to say." (Why can't you get the word you want?) "Something else comes in, something else keeps interfering in my mind. Maybe the word that comes in is a bit silly compared with what I would have said - but it puts out the right word and makes me say it instead. I listen to myself to make sure it's right. You've got an instinct as well you know. If you know something's wrong then it's wrong. Sometimes I don't speak and turn away, but sometimes I just say these other words to see if they will go away."

Case 19 (C.McD.) "My mind wanders at times and I can't concentrate on what I am doing. If I talk to somebody for a while I just realise I'm wandering, and I find it difficult to express myself in the way I want to express myself. I am not able to say things the way I

want to say them. It's a funny feeling and you can't say things the way you want. I try to think of the words but they won't come to me for me to get them out." (What do you do when this happens?) "I don't say anything because I can't say it properly and I know I will make a mistake." (How do you know you will make a mistake?) "I just somehow know it's wrong if I'm going to say the wrong word but I don't seem to be able to say the right word."

Case 31 (J.R.) "Sometimes I can't say it right when I'm speaking. Sometimes I get mixed up and try to get the word out of my mouth. It's what you are thinking about when you are speaking and sometimes you say the wrong thing that you meant to say. You are thinking about what you are speaking and then you say the wrong thing and then you correct yourself." (What do you mean you say the wrong thing?) "I might just be talking and I might be saying something unconsciously and I mean something else. I might be in a conversation with somebody and find it hard to get a word out and then I might make a mistake or something like that when I'm talking. I am thinking about what I am saying and sometimes I might say the wrong word or I might not get it out. It's thinking and speaking at the same time that does it. I'm thinking about what I am saying and then I come to a point and wonder - "Does that make sense - what have I got to say?""

Case 2 (H.F.) "I lose track of what I am saying but it's the receiving end. I lose track of the train of words and it's like

taking down a sentence off a board you know, and the lecturer says the words but you forget them when you go to put them down. I can't re-register them again and build them up as I used to do. I follow them up a bit but it seems to go into nowhere because I don't have a memory for a long sentence. By the time you are finished the sentence if I was taking it down I have forgotten half of the sentence. When I am speaking my memory seems to go and I just forget the words that were previously - what's the word for it - instructed out, and then I get all tied up. I know what I want to say but I can't form it in a sentence. I am not able to put it in front of me and I let it slip. It might come out some way. I try to masticate so that it comes out as if I was eating - that's one way, or I might give my hands a wave or two to stimulate the thoughts. It might be electrical fields I've been in in my past life. I seem to be forced to have a pause before I can speak any more and it puts me off all the time, but you can work and conduct things with your hands and pass over the words and talk with your hands. I try to catch a thought - sometimes I catch it, a word or so, but I can't think too far and my train of thought goes blank and weak and I lose the power of speech because I can't reproduce my thoughts. It depends what frequency the other person is on."

Case 23 (S.G.) "I can't control my thoughts. I can't keep thoughts out. It comes on automatically. It happens at most peculiar times - not just when I'm talking but when I'm listening as well. I lose

control in conversation then I sweat and shake all over. If somebody is speaking I just let them continue until they are finished - I can't comprehend what they are saying. It's trying to think what they are talking about when they are speaking because I'm concentrating so much and trying to listen to what they are saying and I lose track of the conversation." (Can you hear them?) "I can hear what they are saying all right, it's remembering what they have said in the next second that's difficult - it just goes out of my mind. I'm concentrating so much on little things I have difficulty in finding an answer at the time - there's nothing there. The train of thought can be delayed for a time before I go back on to the train of thought. I'm speaking but I'm not conscious of what I'm saying, that's the trouble with me, so I don't know what I am talking about. I've got a rigmarole in my mind now for checking what I say in advance so if somebody speaks to me I get on my guard straight away so that I can make a sensible answer. I try to say something sensible and appropriate but it is a strain because I'm not speaking automatically and when the conversation is going on or when it is finished, I don't know what they are talking about or what I was talking about. I keep talk to a minimum to prevent these attacks coming on."

Case 26 (G.S.C.) "This machine can make me forget what I am talking about. I could be about to say something and be made to forget it when I realise that the thought was so strong a moment before that I

couldn't possibly forget it unless I was being made to forget. It makes my conversation unintelligible." (How do you notice this?) "I just notice that I have difficulty in finding words and I have to use phrases - long-winded round-about terms that didn't sound nearly so articulate as words I might have used if I had been feeling freer. I'm certain this machine can do this. Sometimes there are words that are just there and no more that this machine can help me to use if people are there working for me at the time, and I would chip in and realise that that was exactly the right word to use at the time instead of having to use a whole phrase to explain." (Does this machine interfere with anything else?) "Yes, it alters the tension of my voice and the formation of the word so that it sounds differently." (Does anything else happen?) "Yes, I lose my concentration and then I lose the thread of my conversation - it might be a point I'm trying to make and I'm making it with illustrations and as a result of the employment of the illustration, I mislead myself and get off the track I was on. I lose what I was saying and can't pick up where I left off so that I'm entirely off the track I was on before." (Can you say anything more about your difficulty in finding words?) "Well, my concentration is not so good as it once was, when I'm saying something, I have to concentrate a great deal more now than I had to at one time, when the words would have come quite freely at one time. Now I have to think a good deal before I can bring the words out - my vocabulary isn't so readily accessible as it was at one time." (Why is that?) "It's the

machine that does it so that I can't bring to the surface words that would come readily on another occasion."

(B) Epileptic Patients

Case 1 (E.L.) "I can't speak as fluently as I should without any bother. I get lost for words when I should be able to talk easily. My memory is bad and I can't concentrate on what people are saying. I'm very slow at picking up things and putting two and two together. When I'm talking myself I realise I'm wandering off my talk when people look puzzled by what I am saying. I go on to another subject or something I've mentioned and instead of continuing with what I was speaking about, I go on to something else and so I don't finish the story I had started with because I just forget what I was speaking of."

Case 2 (A.M.) "Sometimes my mind suddenly wanders on to something else subconsciously and I stop and just suddenly say - "just what was I saying there?" and go back to it. I find that I'm speaking and I sort of get stuck for words." (What happens then?) "Well, I just can't say what I want to say - what's in my mind - I just can't put it into words. The words are in my mind but I just can't seem to get it out somehow. I don't know what it is. I get spasms of it and the words have been in my head and I can't just express them and I've just sometimes been - well, I just can't think at the time of what I am going to say."

Case 3 (G.P.) "I sometimes forget the first part of a sentence. I could be blethering about something to you and then I would forget about my first blether - you know what I mean? - blethering about something and then forgetting what I commenced with. It's trying to think of two things at once, to think of the first part of your sentence when you are going to the second part. Sometimes I can't get the right word to put up - the words are in my mind but I can't get them out."

Case 4 (J.C.) "When people speak to me I sometimes tell them to say it a wee bit slower because I just don't understand it - it's just a lot of words. Sometimes I wander off. I speak on different subjects and know I'm doing it. Well, I don't know at the time but I know just maybe a second after it and I manage to try and get back. Sometimes I can't get back. When I want to say something sometimes I just can't get around to saying it because I can't get the words. I try to find the words but I can't find them."

Case 5 (M.R.) "I just can't get the right word sometimes. I have the word in my brain but I can't get it out of my mouth." (What happens then?) "I just ponder over it and think about it until it comes out." (And does it come out?) "Sometimes it does and sometimes it doesn't. It's not always just one word - sometimes it's a phrase or a sentence that I have in my mind but I can't get it out."

Case 8 (J.O.C.) "I find it hard to get into conversation. I can't make up what I want to say. I try to find a word and I know it but sometimes I just can't get it out. I've seen me talking to people and, within a matter of seconds, I forget what I'm going to tell them. I've got to ask them - "where was I?, you'll have to tell me." Then I say, "that's right, now I know where I am.""

Case 9 (D.B.) "Sometimes I have to ask the person what I was talking about so that I can get it finished. I'm very bad at putting myself into conversation with other people." (What makes you bad at this?) "I get lost for words. I've got the words there - it's difficulty of putting the words in the correct places to make a sentence. If I can't say it properly, I just keep quiet."

The above clinical data on schizophrenic speech is closely related to the other changes in subjective experience reported by schizophrenic patients and which appear to occur in a paroxysmal fashion as described above (Section II). The paroxysmal nature of these speech defects in the early stages seems worthy of mention; firstly, because it does not appear to have been emphasised in the literature of schizophrenia; secondly, the disturbance, as reported by schizophrenic patients, bears some resemblance to the paroxysmal dysphasia reported to occur commonly in temporal lobe epilepsy; thirdly, if the observations are valid, such dynamic variation in the level of cognitive function in schizophrenic subjects seems

likely to affect the patient's responses at any given time and influence any assessment made of the thought processes in this disease.

These disturbances in speech may be briefly described by reference to a definition of paroxysmal dysphasia given by Serafetinides & Falconer (1963) in a study of 100 cases of temporal lobe epilepsy, namely - "an inability on the part of the patient to express himself by the correct words while he is still conscious and without obvious impairment of articulation or of hearing. The patient may or may not comprehend fully what is said to him, but his replies are such as to rule out confusion with disorientation or mere speech arrest." Two main types of paroxysmal dysphasia were recognised by these authors to occur in temporal lobe epilepsy, viz.,(a) expressive, and (b) combined receptive and expressive, and they considered that a cardinal feature of paroxysmal dysphasia so defined was that it occurred during a period of awareness and could be subsequently recalled by the patient. In the present study, the disturbance of speech in schizophrenic patients almost always involved both receptive and expressive aspects. If the paroxysmal nature of speech disturbances in schizophrenia is accepted, albeit provisionally, when we proceed to analyse the relevant reports from the above patients, certain common denominators appear to emerge.

Firstly, nearly all of the schizophrenic patients in the study were aware of their speech defects, and in the individual patient, this awareness of the liability of his speech to become

disrupted, was associated with intense emotional reactions, especially in the early stages. The second feature suggested by the patients' reports is that there is an impairment in the automatic selection from memory storage of appropriate words required in order to formulate what they wish to convey. The patients, as a whole, dealt with this difficulty in word finding, by pausing and engaging in a conscious, deliberate search for the word they wished to use, with resultant slowing of their verbal performance.

Thirdly, these patients appear to have an inability to screen out incorrect or irrelevant words from their conscious speech processes. Again the intensity of this defect, as well as its occurrence, varied sporadically from time to time. There was little doubt that in the first few years, at times and in favourable conditions, the patients were able to utilise the correct words, form sentences in an organised fashion and communicate sensibly with others, at least for a brief period of time. On the other hand, at other times, particularly in distracting situations, they used approximations of the words they wished to use and on other occasions still, they were quite aware of their tendency to utilise words which had little or no connection with what they wanted to say. Some of them reported that in the latter conditions, when their consciousness was flooded suddenly by strings of 'unwanted' words, it was extremely difficult to put words together properly in order to form a sentence. At these times the patient would be temporarily reduced to transmitting meaning by pantomime. It is possible

that these patients have a particular difficulty of organising individual words into a pattern in order to formulate sentences, the corresponding opposite of a similar defect in the perception of speech to be described below.

A fourth interesting feature suggested by the clinical data is that the patients appear to listen to their own speech in a more deliberate and active fashion than normal, in an attempt to make it intelligible to others. In the normal state this monitoring process may be regarded as being automatic, producing economy in mental function, but in the schizophrenic patients this process appears to require conscious regulation and control.

A fifth feature suggested by the patients' reports is, that if they continue to talk, they become progressively less able to retain sufficient content of their own speech, in order to connect up what they are about to say with what they had said immediately before. With regard to this, the patients themselves were often aware of their tendency to get 'derailed', or talk wide of the point. This particular aspect of speech disturbance is probably related to the vulnerability of short-term memory, to distraction, suggested by the reports of schizophrenic patients.

In summary then, the disturbances in speech experienced by schizophrenic patients appears to be paroxysmal in occurrence, at least in degree of severity, especially in the first few years of the disease. These disturbances may tentatively be related to, (1) a defect in the automatic selection of appropriate words from memory

storage so that frequently the patient is unable to use the correct word at the appropriate time; (2) an inability to screen out approximate or totally irrelevant words from entering short-term memory prior to the act of speaking. This may be associated with a difficulty in formulating grammatical sentences from individual words; (3) a breakdown in the normally automatic process whereby the individual continuously criticises and audits his own speech in order to make it intelligible to others; (4) a defect in the function of short-term memory, produced by overloading, which renders the patient unable to connect up different passages of verbal output in a logical sequence.

It must be added that these same patients also experienced and exhibited a defect in the perception of speech. In the earlier stages of the disease, the patients reported to the effect that when they failed to comprehend what was said to them they simply - "guessed the answers". It seems likely that this receptive defect will contribute to any assessment of thought disorder in such patients.

If we apply Jackson's principle of physiological order to the dynamic variations in speech function exhibited by these schizophrenic patients, the many apparent contradictions in their performance and behaviour may become more understandable. In order to make this comparison it may be worth while giving a brief description of the development of speech, concerning which their appears to be general agreement. Russell Brain (1961A) summarises

the various stages in the process which include babbling in infancy, proceeding to echolalia, which paves the way for verbal utterances. Gradually words are associated with the objects to which they refer and this requires abstraction of the object from the rest of the environment. This begins with concrete objects and persons but as development proceeds, becomes increasingly abstract and refers to qualities, actions and relationships and ultimately highly abstract ideas. As speech develops, words are used in combination, grammar and syntax link them together, and their mutual modifications and temporal order in sentences make it possible to express more and more complex meanings. Piaget (1951) describes the process similarly, relating speech development to a functional continuity between sensory-motor activity and conceptual thought, whereby verbal schemas become detached from sensory-motor schemas and gradually acquire the function of representation. That is, initially a word is part of an action but later ceases to be so.

It is possible then to draw parallels between the fluctuation in speech function of schizophrenic patients with these gradations in speech development. One would then expect schizophrenic speech to correspond, at different times, to any one of the three main stages of development, and clinical observation of young schizophrenic patients tends to bear this out. Thus the individual schizophrenic's speech may at one moment be abstract and relatively normal, while at his worst level he may be unable to separate the word from the object or action and thus give a 'concrete' response.

With progressive dissolution of his mental state one would expect stages of a break-up in syntactical arrangements and temporal order, passing through a phase of echolalia and ending with babbling. Again, the argument here, in relation to the early stages of schizophrenia, is that this process of dissolution can occur, with rapid onset, but last only for a transient and brief space of time. It is therefore possible that the controversy which prevails concerning the abstract-concrete dichotomy in schizophrenic speech is irrelevant for the individual patient, whose thinking and speech may be both abstract and concrete within a very brief period. Likewise the same view can be applied to the concept of 'overinclusion' in schizophrenia. At one moment the patient's consciousness may be flooded with irrelevant words or items and appear 'overinclusive', but at another moment the opposite conditions may prevail, the patient experiencing a vacancy in thinking, and unable to say anything.

So much for schizophrenic speech per se. It may be convenient to divert at this point and compare these disturbances with reports on the same topic obtained from some temporal lobe epileptic patients. As mentioned above, paroxysmal dysphasias are recognised to occur in temporal lobe epilepsy. Serafetinides & Falconer (1963) found speech disturbances in two-thirds of a total of 100 cases of temporal lobe epilepsy. In half of these (34 out of 67), the dysphasia was paroxysmal and occurred mostly in left temporal lobe epilepsy. Another interesting finding mentioned by these authors was

that in the 34 cases with paroxysmal dysphasia, three-quarters were also subject to grand mal seizures. Serafetinides & Falconer also found that these latter cases showed on radiological examination a slight diminution of the left hemi-cranium compared with the rest of the cases, indicating a more extensive hemisphere lesion, dating from infancy. These authors concluded that in cases with paroxysmal dysphasia, the neuronal discharges were more widely ranging than in cases who did not show this disturbance.

In the present study, details of the speech disturbances found in temporal lobe epileptic patients have not been presented, since they merely confirm the clinical findings reported by Serafetinides & Falconer in their study of a much larger group of such patients. However, the latter authors did not present any subjective accounts from their patients and so it may be interesting to compare the few such reports given above with those produced by schizophrenic patients. Very briefly, the similarities in disturbed speech between the two conditions appears to be related to (1) the paroxysmal nature of the disturbance, (2) the patient's awareness of the defect, (3) the difficulty in finding and using the correct words to express himself, and (4) a defect in short-term memory which makes the patient liable to wander off the point in spontaneous speech. On the other hand, perusal of both types of reports suggests two important differences between the epileptic and schizophrenic patients. These are (a) schizophrenics appear to have a marked inability to screen out irrelevant words from entering

consciousness and this exerts a much more catastrophic effect on their ability to express themselves; (b) schizophrenics find it necessary to monitor their own speech in a conscious deliberate fashion.

It may be concluded here, that the disturbance in selective attention relates not only to external, but also to internal stimuli, which in this case are verbal. These schizophrenic patients appear to lose the ability to screen out irrelevant words from entering consciousness. Frequently, it would appear that individual words are not organised into larger units simultaneously with the act of speaking. This, then, may be another source of overloading of short-term memory, with irrelevant sensory information, which, as many experiments have shown (Broadbent, 1958; Welford, 1958), may interfere with performance. The results of these experimental investigations on attention and short-term memory in normal subjects may help to understand something of the mechanisms underlying schizophrenic thought disorder. If, for example, as will be argued in this thesis, the short-term memory of schizophrenic patients is subject to overloading and vulnerable to distraction by redundant information, then the ordering and organisation of their verbal performance is likely to suffer. In connection with these views, Welford (1958) states - "The span of short-term memory can, however, be extended, if instead of individual pieces of data, whole schemata or 'codings', can be retained as units of data. - This

means that one of the most effective ways in which short-term memory can be used, is to retain information about what material, stored in longer-term memory, should be brought into play and in which order."

IV. Disturbance in Perception of Speech

Most clinical studies of defects in speech perception have been done in relation to dysphasias occurring in organic cerebral disease (e.g. Botez, 1961). However, when disturbed communication in schizophrenia is approached from the standpoint of impaired perceptual function, similar defects become apparent in this disease, as illustrated in the following reports.

Case 29 (G.H.) "When people talk to me it's like a different kind of language. It's too much to hold at once. My head is over-loaded and I can't understand what they say. It makes you forget what you've just heard because you can't get hearing it long enough. It's all in different bits that you have to put together again in your head - just words in the air unless you can figure it out from their faces."

Case 36 (J.McD.) "I can concentrate quite well on what people are saying if they talk simply. It's when they go on into long sentences that I lose the meanings. It just becomes of lot of words that I would need to string together to make sense."

Case 22 (C.G.) "...My thoughts get broken up when people start speaking to me. I have to build up the words and how they have been said... Somebody might say something to me. They might say the word 'bare'. I would have to go over three or four words to get the meaning of what 'bare' is. It's like scrambling the way they used to do in the war. Things are broken up and then they have to be put together again into something I can understand."

Case 12 (F.A.K.) "...You have got to find out the meaning of the sentence. You just pick up different parts and put them together. I have to search carefully. You can't always wait until they finish a sentence, so you may miss just a part. I usually ask them to repeat the sentence."

Case 15 (J.H.) "I have to pay all my attention to people when they are speaking, otherwise I get all mixed up and don't understand them. I have to think what the words mean... You get all kinds of different thoughts in your head as a result of just one word. For a short time I can concentrate, but then a whole sentence I find I haven't taken in. I usually have to ask for a repetition of what somebody is saying."

Case 1 (D.G.S.) "I lose control in conversation then I sweat and shake all over. If somebody is speaking I just let them continue until they are finished, because I can't comprehend what they are saying. It's trying to think what they are talking about when they are speaking, because I'm concentrating so much and trying to listen

to what they are saying I miss what they are saying. I lose track of the conversation. I can hear what they are saying all right, it's remembering what they had said in the next second that is difficult. It just goes out of my mind."

Case 28 (T.McD.) "I don't get in all the conversation when people speak to me. It goes in one ear and out the other and I'm never able to repeat what they have said. I have to change the subject and walk away." (Do you hear them clearly?) "I hear them talking all right but it doesn't register. Most times I just turn my head away from the person."

Case 16 (I.S.) "I never listen properly to anyone now because I always have to think back all the time on what they're saying and I lose the place. My mind is just not clear and I just can't catch anything anyone says. I don't get what the words mean quickly enough."

Case 6 (G.S.) "I'm not picking people up properly. I've got good hearing but sometimes I don't just quite catch on right away. I catch on sometimes and sometimes I don't. I don't hear the words in the proper order to understand."

Case 30 (A.McG.) "I find I can't appreciate what people say now - it takes a long time to penetrate. I can't listen and understand the way I used to. I used to pick up everything that people were saying. I hardly used to miss a thing. Now I can't make out what they are saying. I just hear voices saying things that don't have

any meaning."

These reports suggest that schizophrenic patients have difficulty in the perception of speech. Their frequent failure to comprehend other people's talk appears to result, not from an inability to perceive individual words, but from a deficiency in perceiving words in a meaningful relationship to each other as part of an organised pattern. In normal adult communication, items of verbal information are fitted into context automatically, without the need for conscious manipulation. Thus, the perception of a word does not occur in isolation, but as part of its context in a sentence. The perception of a sentence or passage is a temporal event - "a whole which cannot be fully comprehended until it is complete, and unless its beginning and middle are retained in consciousness to be brought into relationship with its end" (Brain, 1961B).

In schizophrenia, it would appear that this automatic organisation of words into meaningful sequences, breaks down, so that the patient cannot quickly enough comprehend content because he has to attend, consciously, to form. The normal individual is able to process verbal information efficiently by organising the individual words he hears into larger, meaningful units. This is done automatically, in the normal perception of speech, by utilising the transitional bonds inherent in normal language structure, and by screening out the redundant words which occur in most verbal

communications. As with normal visual perception, this ability to organise sensory data as it is being received, verbal in this case, reduces the load placed upon short-term memory.

It would appear that this ability in impaired in schizophrenia, so that the patient's attention is taken up with individual words, many of which may be redundant and which also may interfere with the perception and recall of verbal information in terms of meaningful wholes. Therefore, unless he is allowed enough time to perform the latter task, effective registration does not take place. This temporal lag, before verbal information becomes meaningful, has been noted to occur in aphasic states. Botez (1961) in a study of 200 cases of cerebral tumour, described this deficiency in some detail and attributed it to a disorder of attention.

Thus, any continuous conversation may be a source of stress for the schizophrenic with the emergence of anxiety and other emotional symptoms. Their perception of unbroken speech requires a rapid series of changes of attention between the observer's speech and his own internal store of information. Listening attentively to other people's talk may result in an overloading of the patient's perceptual system. When this begins to develop, the patient shows echolalia more frequently, and becomes more easily distracted by visual stimuli. With continuing verbal stimulation as his performance deteriorates, he may demonstrate echopraxia. Occasionally such overloading of the patient's perceptual mechanisms may culminate in a blocking episode.

The main clinical observation concerning perception of speech in schizophrenic patients was tested experimentally, utilising a technique (Miller & Selfridge, 1950) derived from analysis of the statistical structure of language. The results of this experiment (Lawson, McGhie & Chapman, 1964) confirmed that the difficulty that schizophrenic patients have in speech perception appeared to be related to an inability to perceive the organisation inherent in normal speech, rather than to any difficulty in perceiving or retaining the individual words. This 'depatterning' effect demonstrated in speech perception of schizophrenic patients may be viewed as part of a general disorder of selective attention and short-term memory.

It may be worth mentioning at this point that, since the disturbances in the expressive and receptive aspects of speech appeared to be aphasic in nature, and since the patients' reports suggested the episodic occurrence of ideokinetic dyspraxia, it was decided to utilise standard tests for evidence of organic cerebral disease. Twenty of the patients were therefore subjected to a detailed clinical examination which adhered strictly to the method and tests described by Klein and Mayer-Gross (1957). This proved unrewarding. Apart from disturbances in attention and emotion or mood, which were clinically observable, the results were negative, with the exception that, on one occasion only, two patients (Cases 14 and 25) were unable to carry out a number of make-believe actions without the object, and a third patient (Case 26) was unable to name

common objects. However, when these patients were re-examined later, on three different occasions, these defects were not present. There were of course, numerous reports of metamorphopsia, but this symptom was elicited, not by tests, but by tapping the patient's subjective experience.

It is possible that, if this clinical examination for organic cerebral disease were to be administered to schizophrenic patients, on a very large number of occasions, at very frequent intervals over a long period, it may be more productive. However this would be extremely time-consuming and impracticable for diagnostic purposes. In contrast, using the approach outlined in this thesis, considerable information referring to positive symptomatology, may be obtained fairly quickly in two or three interviews, by tapping the patient's store of subjective experience.

V. Echopraxia

The term echopraxia refers to the automatic repetition by an individual of visually perceived actions of others. It has been reported to occur in a variety of pathological mental states (Stengel, 1947). Descriptions of the phenomenon as it occurs in schizophrenia tend to be limited to a brief reference to its presence in catatonic patients, and it is not generally recognised to be a feature of the early stages of the illness. Before proceeding to the reports of the patients, it may be useful to examine briefly echopractic behaviour first as it is reported in normal

development, and then in clinical conditions, particularly chronic schizophrenia.

(A) Normal Development

Although the term echopraxia is seldom used to describe behaviour in normal childhood development, there are some features of the motor mimicry displayed by young children which correspond closely with echopraxia as defined above. One of the earliest examinations of imitative behaviour was carried out by Baldwin (1895, 1897), who attempted to construct a complete theory of early development based on imitation. Baldwin traced the process through three distinct phases which lead to a socialised self. In the first "projective" phase, the child passively assimilates impressions from others. During the second "subjective" phase, the child is "a veritable copying machine", assuming the movements and attitudes of his model. In the final "ejective" phase, the child controls the previous involuntary imitation and learns to comprehend his model by acting like it.

Piaget (1951) in a study of play and imitation in childhood, considered that imitation evolves through three different stages which inter-relate and overlap with each other.

The first stage, occurring in early infancy, is that of sensory-motor imitation. The imitation of the model is inseparable from the process of perceiving it, so that the presence of a concrete model is required.

At a later stage, from the age of 2 to 7 years, there is a gradual differentiation of this sensory-motor activity, so that imitation may occur with an image of the model and be "deferred" for a considerable time after the absence of the model. Here the memory image is an integral part of the imitative behaviour, acting as a "negative" for potential future imitations.

In the final stage of development from 8 to 12 years, imitation is progressively independent of perception and becomes a function of conceptual thinking. Imitation at this stage differs from the earlier forms in that it is consciously discriminative and deliberate, refers to detail in the model, and is affectively determined. It is no longer a perceptual-motor activity but refers to data lying outwith the immediate perceptual field.

Acccording to Piaget, this transition from primitive sensory-motor schemas to verbal schemas underlies the gradual acquisition of language. The purpose of imitation is to achieve understanding and facilitate adaptation to the environment. "Imitation then, and this is our essential conclusion, fits into the general framework of the sensory-motor adaptations which characterise the construction of intelligence."

This concept of functional continuity pertaining to different stages in the evolution of imitative behaviour, which is implied in the observations of both Piaget and Baldwin, is closely in parallel with the views of evolution of the nervous system expressed by Hughlings Jackson (1958). This seems worth mentioning

at this point because of the relevance of such concepts for interpreting the clinical data dealing with echopraxia in schizophrenia. Hughlings Jackson pointed out that there was no antithesis between the terms "voluntary" and "automatic". The term "voluntary" is a compound of the psychological and physiological. Concerning movements, there are all degrees in the process of evolution from the "most automatic" to the "least automatic", which is voluntary, but there is no absolute distinction between the two. With progressive disease of the brain it is the least automatic movements which are first affected, and with continuing dissolution of the nervous system, there comes a point when the "most automatic" movements are affected.

Piaget stated that, although in the process of evolution primitive sensory-motor adaptation is largely replaced by conceptual thinking, the former nevertheless remains all through life, "...the essential tool for perceptive activity and the indispensable intermediary between the perceptions and conceptual intelligence". Thus in normal adult behaviour one may still observe traces of this primitive motor mimicry in the process of empathy which is also intricately linked with the visual perception of other people's actions.

So far, little experimental work has been done in this field. However, Sarbin (1954), in a paper on role theory, described an experimental study (Sarbin & Hardyck, 1952) which investigated the influence of postural behaviour (as actions of persons) on role

perception. This work suggested that an individual's perception of others is more accurate if he empathises with them.

(B) Echopraxia in Catatonic and Other States

The classical view that echopraxia is a sign of "automatic obedience" is still quoted in current texts, although this was doubted by Bleuler and questioned in more recent times by Stengel (1947). Bleuler (1911) considered that echopraxia in catatonia might result from a weakening of associations so that the patient failed to inhibit the perceived movement and "consequently the imitation is carried out". Bleuler also spoke of the sensory impression becoming predominant and simultaneously suppressing other associations, or alternatively, the patient might believe that the gesture he perceived implied a command to imitate it. Bleuler concluded this brief discussion of possible mechanisms in echopraxia by stating - "However, all these conjectures can hardly satisfy us".

Alternative views have been derived from psychoanalytical theory. Representative of this approach is Fenichel's view that echopraxia in catatonia is a sign of regression to an infantile level where the mechanism of primary identification predominates. Fenichel (1946) attributed a restitutive function to the phenomenon, regarding echopractic behaviour as a primitive attempt at regaining contact with the environment.

The most recent psychiatric investigation of echo

reactions appears to be that reported by Stengel in 1947. This was a study of echo reactions in various clinical states, including catatonic schizophrenia. Stengel referred to echo phenomena observed in clinical conditions which he outlined as follows:- (1) aphasia of the "transcortical" type and advanced dementia resulting in a similar speech disorder; (2) low-grade mental deficiency with incomplete development of speech; (3) chronic epilepsy; (4) states of clouded consciousness of various origins; (5) catatonic states; (6) early period of speech development in childhood; (7) states of fatigue and lack of attention in the normal.

In interpreting his clinical observations, Stengel considered that echopraxia resulted from an urge to act and an impairment of incomplete development of spontaneous activity. He viewed echo reactions generally as an interaction between an impulse to maintain social contact and an opposing tendency to extreme autism. Stengel considered that echo reactions do not consist of indiscriminate repetition but depend on personal rapport and that selectivity was exhibited by his patients, with regard to both the person imitated and the action repeated. Stengel used his clinical data to argue against the assumption that "automatic" echo reactions are fundamentally different from others. Finally, he found that the psychological mechanism underlying echo reactions was that of primitive identification and that the conditions which the phenomena had in common, in a variety of different clinical

states, included an urge to act or speak, a tendency to repetition, and an incomplete development or impairment in the expression and perception of speech.

A common denominator of these interpretations concerning echopraxia in chronic schizophrenia thus appears to be in the nature of an analogy with the early stage of development, occurring before the establishment of an adequate ego boundary when there is no clear differentiation between the "I" and the "not I". In the present study, echopraxia in schizophrenia was approached from the standpoint of impaired perceptual functioning, and the following reports are representative of the clinical data obtained.

Case 38 (K.M.) "If Frankie (her boy-friend) was here - if he was standing up, I would be apt to think that I should be standing up too. I used to try and think myself somebody else. I was thinking too much of the other person. The way Jean (her sister) spoke, I wanted to speak. They had control over my mind. If Jean would walk down the road with an umbrella in her hand, I would try and walk the same way, even though I didn't know the step to take."

Case 32 (A.H.) "I sometimes doubt myself as a person. When I'm mixing with people my own personality goes; it gets scattered. I am reflecting parts of them, just to try to be someone among them. I lose myself and become a mirror of them. If they laugh, I must laugh; and they do something, I do it. It's got to be coincident, in complete sympathy. If I could assert myself as a person into

the situation, it would be much better for all of us. I've got to make the landscape acceptable to the person, the landscape being me. If I am walking along the street and somebody is walking ahead of me and I think about, I get afraid I will take up the same step."

Case 15 (J.H.) "You look at the object and concentrate on it so that you become the object. There's nothing else to hold the mind other than the object. The mind being concentrated on the object - this is the state of going into a trance - the mind loses the capabilities of receiving any messages from any other objects. The messages give us a sense of existence. When the mind concentrates on one particular object only, that one object is the only one to react to, and the mind becomes one with the object, the object is the mind. You lose the sense of the object's separate identity. While you're with it, you're not with it. It's the same with people. When I meet a person there is a sudden confusion for a moment."

This patient stated that by concentrating visually on a person he could temporarily "become" that person. He reported to the effect that if the other person moved, the condition of being "at one with him" was disturbed and he had to alter his own body position in order to accommodate to the changes he perceived in the other person. Each time this happened, he felt that he was somehow different - "You are dying from moment to moment and living from moment to moment and you are different each time."

Case 10 (A.McD.) "You sit there and you don't move much at all and you don't appear to change much. If you move noticeably, the person you are talking to might get distracted and lose track. One time I was sitting with a friend and suddenly he changed and I told him "don't move or I'll have to move too". You have not changed much here because you have remained static, but sometimes it does affect me. Somebody moves or crosses his knees (as the observer had just done, and which the patient repeated). I feel I have to move at the same time. It is a matter of time - like the two minds getting attuned, for it makes it easier to understand the person's thoughts - reading the other person's mind. The problem is to differentiate myself from other people. I might have to impersonate somebody, playing a role or being an actor for a short period. I know you can't change yourself and become another person completely, that is obviously impossible, but you can play the part for a time. I say to myself "who will I be today?" You take in more of a person, you get acquainted and you gradually build up the person."

Case 36 (J.McD.) "I could be my brother's sort of mind or my other brother's sort of mind. More or less when I'm facing him it makes me think he is just speaking to himself. If I have time to think about the other person you sit and study the person, you try and copy the way he reads or the way he speaks. That's how you imitate the other person. There's not many people you can

imitate. You can do it by thinking hard enough to get a vision, make your mind a blank. When you have him in your mind and then you can try and express what he is saying, the way he reacts."

This patient produced more material of this kind, all of which indicated a confusion of identity. "Your mind gets trained to this person, and when you see this person doing all these reactions, speaking and maybe moving about, you can sometimes - you can actually feel - I move in the same way as they were, but I don't know if the person feels whether I am in his sort of mind. Sometimes it makes me think I am taking an impression of his body. You would think I have taken an impression of his mind. I feel it coming on but I just can't do anything about it. I just have to work along with it."

This patient further described how, while sitting listening to a radio programme, he recalled seeing certain statues of Christ and saints in the church which he attended. In this process of recall from memory he appeared to assume the same bodily position of the particular statue or image which was in his mind at the time: "I have seen the saints in my mind and when I can visualise it very clearly I find my fingers and my hands going into the same position as the statue of the saint, and I'm standing the way he was standing."

Case 22 (C.G.) During the recorded interview, this patient suddenly brought spontaneously to mind certain experiences he had had

while in hospital. "Oh I have never talked about this before. When I was in that other ward - there was - sometimes the action of people. There was a Willie T. He used to walk about lighting his pipe. It may be the case that I was walking about and the image came into my mind of his walking about. It was almost as if I was he. I was doing the same things as he was doing. Some others too. I knew I was walking about and I felt it was the same action - doing the same things as he did - the say way he walked. I think it was just memory."

This patient also reported to the effect that while he was perceiving an image of a girl, he felt that he had assumed a female body and began to walk and act like a female. However, the patient's motor behaviour was also influenced by direct visual perception of other people's actions. He said, "I found people could speak to me by their actions. If they were standing with their arms folded, I found my arms and shoulders moving." This patient not only passively assimilated the movements of other persons and equated these movements with thoughts, but at times engaged in a "conversation of gestures". In relation to this he said - "It's like casting your mind over to the other person, it's thought you're passing over."

Case 29 (G.H.) "I don't know if I'm George today." When asked to explain this, he replied to the effect that he had just been in the company of another person and had copied his actions. "I

felt I was better, a man grown up. I just thought I could use any name. I can use any kind of name that goes with my mind. I feel like I am everybody. When I'm talking I feel I just want to do what they are doing and be everybody and copy them to be what they are. It helps me to understand everybody and what they are and how they feel."

This patient also made a spontaneous report at interview which seemed to be a projection of his own echopractic experience on to the observer, with the development of an associated delusion of supernatural power. On this occasion the observer touched a paper on his desk and the patient said, "I can make you move just now, doctor. I can make you touch a table." (How can you do that?) "You did it. I pointed my finger there and you pointed yours. I moved my finger just now and you were looking at my finger and studying it and the brain came from my finger and you put your finger down there just now as if I was guiding it. I was guiding it because my finger went that way and yours did the very same."

Case 12 (F.A.K.) "I feel better when I imitate people in the ward or on television. I feel good and competent as if I'm somebody when I copy them."

Case 8 (D.R.D.) "I can't see and hear properly. I just can't control my body. If I keep talking and by looking and hearing and seeing, my mind transfers into other people's minds and they have

control of my movements, making me do what they are doing. I can control their actions as well, even people on television. I make them do things. It's having control over other people's minds and making them move."

Case 19 (C.McD.) "I can't look at people while I'm speaking to them because if I look at them I have to copy their facial expressions and I get distracted from what I am saying. If people laugh I have to laugh and this annoys me."

The reports of these schizophrenic patients, three of whom were hebephrenic (Cases 32, 36, and 29), appear to indicate that subjective awareness of echopraxia may precede its overt clinical manifestation by a very considerable period of time. Thus, specific enquiry for this symptom may lead to early recognition of its presence in the clinical picture in hebephrenic as well as catatonic states. Although echopraxia in chronic schizophrenic patients may persist for long periods of time as described elsewhere (Chapman & McGhie, 1964), in the early stages it appears to occur only at certain times under certain conditions. The echopraxia reported by these patients chiefly occurred when they were looking at and attempting active communication with another person. To some extent, this bears out Stengel's view that echo reactions are dependent on personal rapport. Another feature suggested by the present study was that echopractic behaviour most frequently occurred when verbal communication was in process of breaking down, albeit

transiently. This too is in agreement with Stengel's observation that echo reactions are associated with impairment of the expressive and perceptive aspects of speech.

The echopraxia, described by the patients in this study, appears to have a close relationship in time with the other subjective changes in perceptual experience which the patients report to develop during the episodic "blank spells", or blocking phenomena described above. There appears to be a point of time when the patient is so overwhelmed by a flood of sensory impressions that it is impossible to assimilate them, or to select any of them for integration with past experience. The author very tentatively suggests from these observations, that it is at this point of time during the transition from active attention to a condition of inattention that perception becomes disturbed in relation to the body, self and environment, and that echopraxia may develop. In the case of those patients who, in addition to blocking phenomena, also experienced transient disturbances in visual perception, echopraxia was much more marked and overt.

Although it has been said above that echopraxia chiefly occurred when the patients were looking at another person, this was not always so, as illustrated by the reports of two patients (Cases 36 and 22) who behaved in a similar fashion while perceiving a memory image of another person. Also, apart from observations made in this study, echopraxia of a gross degree in relation to television images has been previously reported (May, 1955).

Since similar behaviour can arise from three quite different sources, it would seem that the source of perceptual stimulation is not such an essential feature of echopraxia as the way in which the sensory impressions are perceived and assimilated. If we accept this type of motor mimiory, in response to indirect sources of stimulation, as being no different from that which occurs in the face-to-face situation, then it may be possible to broaden our previous definition of echopraxia to include all forms of mimetic motor behaviour, which arise simultaneously with the perception or recall of any sensory data pertaining to the actions of another person. This definition of echopraxia would then correspond more closely with that of imitation in childhood development as described by Piaget.

The clinical findings in the present study confirm that the patients identify in a primitive way with the other person when they engage in echopractic behaviour. However, the dynamic conditions in which echopraxia occurs appear to be more complicated than this. The identifications experienced by these patients appear to be of a secondary and transient nature and at the time of interview, none of them suffered a persisting loss of identity. The duration of these fleeting identifications appears to coincide with the time taken for the visual perception of the other person to be assimilated in consciousness. In other words, a change in the perception of the patient's "social space" was associated with a corresponding change in identification. The patients found that

they could prevent both these fleeting identifications and the development of echopraxia by looking away from the other person. For example the patient C.G. (Case 22) said - "They make movements first and I contact back. They have a certain control over my mind and body, so I look away. I cannot look at a person when this comes on for all these peculiar sensations will come over me." As far as one could observe, the identifications did not precede the echopraxia. Both phenomena appeared to occur simultaneously as the patient's perceptual contact with his environment was being disrupted as described above.

It is suggested then, that echopraxia may develop as a result of a disturbance in the perception of the environment, one's body and one's self.

With this approach one can trace different degrees of echopraxia in schizophrenia which seem to bear a resemblance to Piaget's three developmental stages of imitation. In one extreme, echopraxia in schizophrenia can be almost completely "automatic" or "involuntary", even in the early stages, and in the other extreme it may be a more "voluntary" conscious act. At certain times the patients had very little control over their echo reactions. On the other hand, the patient A.M. (Case 4) who talked of playing roles and said to himself - "Who will I be today?" - appeared to be exercising conscious discrimination in this respect. Echopraxia in relation to memory images appears to lie somewhere between these extremes. This form of echopraxia is still "automatic" in the

sense that it appears to be an integral part of the perceptual activity, but there would seem to be some degree of discrimination involved. "Voluntary" echopraxia appears to occur when the patient's cognitive function and perceptual processes are least disturbed. With progressive dissolution of mental function, whether this be transient as in the early stages, or more persistent as in the chronic stages, echopraxia may become more automatic.

If this comparison with genetic psychology is valid, it may be possible to obtain a better understanding of the significance of echopraxia in schizophrenia. We could then consider a functional continuity to exist between the primitive sensory-motor activity represented in the "automatic" echopraxia of the chronic catatonic and the "voluntary" form, nearer to the process of empathy in normal persons, exhibited by less deteriorated patients. Echopraxia in relation to memory images would be intermediate in this transition, corresponding with Piaget's stage of deferred imitation; all three stages of echopraxia could similarly be related to corresponding levels of language development. In other words, the degree of "automaticity" in echopraxia can possibly be utilised as a measure of impairment in thinking and language ability. Echopraxia in schizophrenia would be regarded as a sensory-motor adaptation which may vary in degree, facilitating understanding and adaptation, and in an interpersonal situation serving as a primitive form of sensory-motor communication.

Returning to the concept of evolution and dissolution of the nervous system, we might conclude at this point that one of the earliest changes in schizophrenic experience involves impairment of the process of empathy with other persons. Without this ability - "the essential tool for perceptive activity" - or as the disease progresses, without more overt echopraxia, the schizophrenic's perception and understanding of the outside world become subject to increasing degrees of distortion.

The phenomenon of echopraxia in relation to memory images seems worthy of elaboration, since it has not been hitherto reported in the psychopathology of schizophrenia. The reports of the patients who engaged in this behaviour suggested that the dynamics of the process were similar to those described by Piaget in his "deferred imitation" in childhood. That is, the visual perception of the image is not dissociated from the accompanying motor activity, but is inherent in it. The visual or memory image is the "negative" which is continued as a "positive" in the imitation. This form of echopraxia is thus a perceptual-motor activity, the imitated action being an integral part of the perception of the image itself. Consequently, the duration of the activity does not outlast the perception of the image. If this is true for schizophrenia, its implications for bizarre behavioural changes in this disease are considerable. Thus, as happened with two patients (Cases 12 and 29), if a schizophrenic is engaged in the perception of an image of Christ being crucified, he is likely

to "act out" this perception by appropriate modification of his motor behaviour. However, one could conceive such perceptual-motor schemas as having a content potentially more dangerous than this, and it is possible that echopraxia to memory images, especially in the acute cases, could be the source of homicidal or suicidal acts of an "automatic" nature.

It is tempting to compare echopraxia as described above with similar patterns of behaviour in childhood and in particular to Piaget's three developmental stages of imitation. However, it would seem important not to attempt to link echopraxia in adult schizophrenic patients with any one stage of infantile development, because the process appears to be a very dynamic one and at different times in the same patient one may observe behaviour which bears some resemblance to all three stages of development.

VI. Gesture Language

The words gesture and pantomime are often used synonymously, but Critchley (1939) distinguishes the two, defining pantomime as that variety of dumb show which aims at expressing an idea, while gesture connotes those movements, particularly of the hands and face, which accompany speech for the purpose of emphasis. Critchley states that gesture is not only an important means of communicating ideas and emotions, but also serves as an important adjuvant to spoken speech. Pantomime movements are deliberately executed actions of a high propositional content. According to

Critchley, pantomime is increased in cases of aphasia where the loss of speech is not complete and where the patient may be verbose but unintelligible.

Pantomime and gesture appear to have been neglected in clinical studies of schizophrenia. According to Critchley (1964) schizophrenics differ from aphasic patients in that they do not attempt to overcome their difficulties in speaking by using a play of gesture. The clinical findings in the present study conflict with this view. Schizophrenic patients were repeatedly observed to utilise gesture or pantomime, when they were having difficulty in communicating their ideas. The following reports illustrate the subjective aspects of this activity.

Case 22 (C.G.) "I like talking to a person but not in audible words. I try to force my thoughts into someone. I concentrate on how they move. I think of a message and concentrate in my head. It's thought you're passing over. I send the messages by visual indication. Sometimes it's my foot, but it might be my arms, legs, sometimes the shoulder, sometimes my whole body. I had the impression other people started this. They made movements first. I could contact back. They had a certain control over my body."

Case 10 (A.McD.) "My hands move quicker than my mind. If I want to impress something on you - and that is what I want to do strongly- I must do it by gesture or movement. When I get confused with people talking to me, if I want to stop the conversation, I turn

away or wheel round and turn my back. That signifies that you want to stop listening. I usually give them a warning first by looking over their shoulder or looking at my watch or something in the room. If they stay talking when I am past my peak of absorbing, it sounds toneless and I lose the trend of the conversation. My friends cannot get through to me. I have to overact or dramatise gestures or overemphasise my words in writing, putting two or three words on one line."

Case 7 (T.S.) "I just can't get out the words - they stick inside me. I can tell you better what I mean by a physical demonstration."

Case 35 (A.A.) "My brain is not working right - I can't speak properly - the words won't come and I've got to use my hands to speak like a dumb person."

Case 15 (J.H.) "I try to do without words. I think what impressions I want to give and then try to show them with movements. I might gesture with my hand or move my head - facial expression - display displeasure by frowning. I don't let the words revolve in my head - just the meaning. I let the meaning run round in my head and understand it."

Case 25 (J.O.McF.) "I have ideas all right but I find difficulty in transferring them to other people. I can't explain things to people unless I do it in a practical way. If I want to say something I have got to take the thought and add on a movement to

the word to make it clear."

Case 32 (A.H.) "Sometimes I cannot talk. I try to keep everything stable by using my body as an alternative to a vast flow of words. It's a sort of attraction of their attention away from words. My body is an instrument of self-expression through which I can live."

Case 2 (H.F.) "It's difficult to speak in words - can't say anything - have to use my body to tell people anything."

Case 31 (J.R.) "I can't arrange my words right. Instead of speaking I move certain parts of my body, nose or eyes or something to give people a picture of what I am saying."

Case 4 (A.F.) "If people talk to me about anything - say the weather - my mind feels no response and I have difficulty in finding an answer at the time. There's nothing there and I can't get the ideas quick enough. I can't speak it out so I reply by just moving my head or hands or something to indicate what I mean."

VII. Disturbances in Motor Functions

During normal development, economy in mental function and adaptation to the environment, are achieved in a process, by which certain activities, after constant repetition, become more automatic, so that they can be carried out spontaneously, with a minimum of conscious control. Attention is progressively less

taken up with the activities themselves and is directed more towards their goals. Kubie (1954) describes this process as follows: "Preconscious processes drop out of the central focus of consciousness through repetition. Thus all simple activities of life such as breathing, sucking, excreting, moving, crying, are originally random and often explosive acts. Early in life their purposeful execution is learned through repetition, by which they become economically organised into synergistic, goal-directed patterns. As any such act is fully learned, it can be initiated simply by a contemplation of its goal; and as this happens we gradually become unaware of the intermediate steps which make up the act. This great economy is achieved in the process of learning by repetition. It is in this way that we become able to walk without pondering each step, to talk without working out the movements by which we enunciate each word... The importance of this preconscious system of conscious function cannot be over-estimated... It is inconceivable that we could have any scientific, artistic, literary, mathematical, or indeed any creative functions without the capacity for enormous economies which preconscious processes possess."

Thus it is not just perceptual activity which has to be organised for efficient functioning, but also motor output. Movements are executed, not as a series of isolated units, but as whole sequences, smaller units being bound together into larger units. Welford (1958), describing the nature of skill, states - "Where conditions require or permit virtually exact repetition of

a unit many times, performance tends to become highly stereotyped in the course of practice, and the whole cycle can be run off very much as a chain response with each member acting as a cue for the one that follows. Even in this case, however, the unit seems to behave as a whole rather than as a simple chain because it is often impossible, and almost always difficult, if a cycle is interrupted to begin it again in the middle without some rehearsal of the parts already completed."

That schizophrenic patients suffer a loss of automation in mental function, has already been suggested by much of the clinical data presented above. However, the following reports may serve to highlight this particular change.

Case 27 (R.W.) "I'm thinking too much, that's the trouble. I'm slowing myself down and trying to get myself organised just step by step. I know I can talk to people but I must talk slow, too slow maybe. I'm slowing myself down because I realise that if I go too fast I might just go over the score sort of style, and do some damage. Even with simple things now. I mean if I sat down just now to write a letter I would be more deliberate in all my movements, otherwise everything would go too fast."

Case 15 (J.H.) "When I'm sitting writing or trying to do something, I see the whole system of activity. What has to be done has to be brought completely into my consciousness. It used to be automatic but now I've to conscious it. I can move my muscles

with effort as if they are thoughts that you can move about. I am conscious of my body as something that makes awkward movements. I become more conscious of the fact of breathing. I'm reacting in a mechanical way to people."

Case 38 (K.M.) "None of my movements come automatically to me now. I've been thinking too much about them, even walking properly, talking properly and smoking - doing anything. Before they would be able to come automatically."

Case 22 (C.G.) "If I do something like going for a drink of water, I've to go over each detail - find cup, walk over, turn tap, fill cup, turn tap off, drink it. I keep building up a picture. I have to change the picture each time. I've to make the old picture move. I can't concentrate, I can't hold things. Something else comes in, various things. It's easier if I stay still."

Case 25 (J.O.McF.) "I think too much about what I am doing and I break everything up. For example, I'm sitting here talking to you, that's one thing. Suppose there's a 'phone over in that corner and it rings. I listen to it ringing, that 's two things. If I get up and walk to the 'phone, that's three things. While I'm walking over there I've got to look - I see things, that's four things. What puzzles me is how can I do all thead things at one time. I'm afraid to move without giving all my attention

to it because if I'm doing something else I might carry out the wrong movement."

Case 36 (J.McD.) "I get confused if I try to do several things at the same time. I've to think an awful lot ahead of what I'm going to do and it takes up a lot of time. I'm too conscious of everything I'm doing, especially moving and speaking."

Case 40 (J.W.) "My brain is slowed up and when I'm talking to someone I don't know what to say back to them to keep it going. I think about it so much that I don't know what to say back. I don't seem to be relaxed when I'm walking. I'm thinking about it in case I might be doing it wrong and I'm trying to do it right by just trying to concentrate on every step I'm taking."

Case 10 (A.McD.) "My mental faculties have become impaired. I am more acutely aware of my body, my fingers, my legs, my eyes. I've become very interested in how they work. I want to find out more about their function. Sometimes I find myself up and doing things, standing up or carrying out a movement without knowing it first, and then realise that I have not controlled it."

Case 3 (T.McL.) "I can do little things that are old habits, like polishing my shoes or washing my face, but when I try to do anything more complicated I have to concentrate very hard and work it out in the mind beforehand, or else I get into a spot. If I'm going to say something and get another thought in my mind, I have

got to watch and carry that thought that I'm going to say, out first, because if I don't, I'll forget what I'm going to say and carry on with that new thought, and it means my mind is running along two thoughts. Well, it's nearly impossible because I've got to drop one or the other."

Case 16 (I.S.) "I find it very difficult to do things now, just everyday things like shaving, things that you do immediately you get up. Just things that I used to do without thinking, like hanging your coat up or taking your tea. I am very easily put off now - by noises or people speaking to me. It's trying to concentrate on two things. Sometimes I have just to cut everything short and sit down."

These reports suggest that schizophrenic patients have an impairment in the ability to carry out purposeful activities which were previously self-regulative. They appear to have lost access to previous learning so that they are often unable to initiate an action simply by contemplating its goal. Instead, their attention seems to be taken up with the intermediate steps, which now require conscious co-ordination. There appears to be a loss of the organisation normally inherent in motor activity. Thus much more detail has to be retained in immediate memory and consciously processed for the initiation and execution of simple actions. In addition, the conscious co-ordination of motor sequences is vulnerable to distraction by other stimuli occurring

simultaneously. The schizophrenic's psychomotor performance is consequently slow and deliberate, and readily interfered with.

The above reports refer chiefly to the loss of spontaneity in moving and speaking. However it can be inferred from the rest of the clinical data, that this deficiency which is associated with a heightened awareness of mental and bodily processes, and flooding of consciousness with excess sensory data, applies also to auditory and visual perceptual tasks. It would appear then than schizophrenic patients suffer a loss of economy in mental function with a resultant impairment in adaptation to the environment. Given sufficient time, they may be able to carry out a single task satisfactorily. However, when they are required to do two or more things at the same time, for example move and speak, or look and listen, then this impairment in mental functioning manifests itself by a detriment in the patient's performance, and possibly results in a blocking episode. It has already been suggested that impairment in the continuous and simultaneous processing of information, may result in a disturbance of consciousness (p.35) and also arouse a great deal of uncertainty which impairs performance (p.16). In view of the importance of these suggestions, it may be worthwile quoting a few conclusions which Welford (1958) derived from his analysis of skilled performance, since they are relevant to the data which has just been presented.

"A result of change in skill during the course of learning seems to be that when learning becomes very thorough, conscious

control seems to drop out. What exactly happens when this stage is reached is not known. It seems frequently to be associated with the acquisition of rhythm and thus, presumably, with the attainment of larger 'units'. Often it is said that the performance has been passed over to the 'lower centres' of the brain. This statement is, however, unsatisfactory. If it means that the cortex is no longer functioning, it is clearly untrue. If it means that so-called higher mental processes of decision or thought no longer occur, it merely restates the observed facts in a physiological language forwhich there is no justification. Work by Leonard (1953) suggests that some dropping out of consciousness occurs when the subject is working under such conditions that he gives his whole attention to signals on the display and has no time or need to give attention to his responding actions. It seems fairly clear that this can only occur when the actions are of an accuracy such that their outcome is not in doubt. We might thus expect that well-practised actions could be carried out with relatively little conscious attention. More generally the view seems to be tenable that what we recognise as consciousness in the full sense - as opposed to merely not being asleep - arises essentially when some uncertainty requires to be resolved and that the apparent loss of conscious control in highly practised skills is a result of the virtual elimination of uncertainty in performance.

We have noted that the human perceptual-motor

'mechanism' receives input data continuously and simultaneously over several channels, and is able to take action continuously and simultaneously with various effector organs. Somewhere between input and output, however, there seems to be a single channel which we may term a decision mechanism receiving data, initiating action and, where necessary, checking the occurrence and results of action.

We must regard the decision mechanism as a single channel of information and the channels feeding it are channels of information rather than of stimuli.

The decision mechanism appears to be concerned fundamentally with the resolution of uncertainty, which we have previously suggested is intimately associated with conscious attention. On this view, when a performance is so thoroughly learnt that it becomes 'automatic', it can be carried on while leaving the decision mechanism virtually free.

The decision mechanism will for a period after each signal be fully loaded so that other signals following within this period will have to be stored in short-term memory. If so many arrive that the subject's short-term memory is overloaded, some signals will be missed. If adverse circumstances or any other cause reduce the capacity of short-term memory the tolerance to such bunching of signals will be reduced. Similarly, any slowing of the decision process will not only interfere with the accurate timing of responses, but will also throw an undue load

upon short-term memory and lead to the same result.

Once such overloading leads to breakdown, a vicious-circle situation may easily arise: the missing of some signals disturbs the flow of performance and interferes with the subject's expectations by disrupting the 'coded' sequences. As a result, incoming signals have to be dealt with piecemeal and in consequence take more decision time so that performance is slowed. This slowing aggravates the very factors which have brought it about, and the whole performance tends to get worse and worse until some limit is reached and performance is stabilised at a lower level."

VIII. Emotional Reactions and Development of Delusions

Two-fifths (40%) of the patients reported experiencing changes in visual perception. Although the time of onset of these changes could not be pin-pointed precisely, it emerged from the history-taking that, in many cases, these changes occurred long before admission to hospital, and before the patient became noticeably ill. The duration of illness given for each patient (Table 1) is therefore only approximate. Examination of the development of these changes suggested that the underlying process, was an insidious one, even in the otherwise, apparently acute, cases with sudden onset. The clinical data also suggested that alteration in colour or sensory quality preceded the other disturbances in visual perception. Most of the patients who experienced this change, reported to the effect that, for a time, everything

around them looked fascinating, objects standing out vividly in contrast to the background. These initial changes in mental function were experienced as pleasant, and a number of patients at this stage went through a transient period of mild elation. Coincident with this alteration in perception, these patients appeared to regard everything with new significance and there was a general tendency for their interest to be turned to ruminating about the world and life in general, and also to specific topics like religion, psychology, philosophy, art and literature.

However, as the breakdown in visual perception progressed, and as the other disturbances in perception and cognition which have been described, developed, this early emotional reaction changed to one of very intense anxiety. The characteristic complaint at this stage, with regard to vision, was to the effect that the patient could no longer see objects standing out clearly from the badkground, and that instead they were looking at many irrelevant aspects of the environment, and were less able to perceive objects as meaningful wholes. At this stage the patient's failure to adapt to his environment became more manifest, and they found it increasingly difficult to maintain their previous working performance. Short bouts of depression with suicidal ideation were common at this stage. However, none of the patients in the study committed suicide.

Many other reactions which gradually developed could be traced to the particular defects in perception and cognition

described above. These secondary reactions appeared to have a common underlying aim, which was to reduce quantitatively the intake of sensory stimulation from the environment at any particular time and also to restrict motor output. For example, clinical observation and the subjective reports, suggested that the patients were attempting to reduce visual stimulation by voluntarily maintaining a fixed gaze. The disturbance in visual perceptual constancy (referring to size, shape and distance) could also be corrected by certain types of catatonic behaviour, but this will be discussed separately below. There also was a general tendency to overcome difficulties in speech production and speech perception by avoiding conversation. This often meant that the patients had to avoid people. Thus social withdrawal was, in part, a voluntary activity carried out by the patient for his own protection. As the disease progressed, some of the patients attempted to reduce stimulation by more concrete methods such as plugging their ears, or keeping their eyes partly closed. These reactions appear to have a rational purpose of maintaining some degree of stability in mental function.

However, as the various phenomena, described above, were continuously experienced, the patients gradually developed less rational and eventually floridly psychotic explanations to account for their experiences. Paranoid ideas and delusions of various kinds could be seen to develop in relation to the various categories of altered experience which have been described.

In most cases, the delusions were multiple and usually transient. In no case did a delusion appear suddenly in the patient's mind without a previous disturbance in perception or cognition. Delusions expressed by individual patients could be traced to disturbances in visual perception, speech production, perception of speech, and blocking, with its associated phenomena of echo-praxia, dyspraxia and confusion of identity.

For example, concerning visual perceptual disturbance, one patient (Case 3, T.Mc.L.) came to the conclusion that other people were deliberately putting him to sleep and causing him to see things altering in size and shape. Another patient (Case 35, A.A.), in relation to the same defect, expressed the delusion that he had the power to change the shape and size of people and objects.

Multiple delusions appeared to develop simultaneously and be derived from the patient's continuing experience of blocking phenomena. Ten patients interpreted this change in terms of death and resurrection, and at the same time, expressed delusions of identity, claiming to be Christ, a saint, or some other person. Six patients, who at an earlier stage had blamed other people's talk for producing their disturbed state of mind, later claimed that other people were making their minds go blank by using hypnotism. Seven patients were convinced that other people were doing it on purpose, but could not say by what means. Four patients attributed their blocking and other phenomena to unseen spirits or evil agencies taking control of their minds, and two

patients blamed radio and television. Those patients who experienced and demonstrated echopractic phenomena, expressed the delusion that the other person, whose gestures they copied, had control over their minds and bodies. The following is only one of many examples of how these particular patients, in the later stages of the illness, interpret blocking and echopractic phenomena. The patient (Case 7, T.S.), after one year's experience of these phenomena, said - "People are trying to control my brain and make my body work - trying to take over my body. It's a medium of minds; everybody's mind is connected up. They go into your body and take part of your body and put their parts in and make them move. The brain power gets taken away but I have always managed to get out of it."

Three patients (Cases 7, 8, and 29) had a delusion, which appeared to be a projection of their echopractic experiences on to others, that they could control other people's minds and bodies and make them move at will. Several patients, after repeated experience of echopraxia and pantomime, at some time in the illness, had the delusion that they could communicate with others without using words - merely transmitting ideas by a bodily movement. At an even later stage in the illness, these patients claimed that they did not even have to see the other person, but could transmit ideas over great distances by telepathy, and that also their thoughts could be read by others in the same way. Three patients, while conjuring up a memory image of a female, expressed the transient

delusion that they had female bodies. Concerning difficulties in speech production, the patients tended to attribute this defect to the same source as their blocking experiences, expressing delusions of influence by other people using hypnotism etc. Regarding deficiency in the perception of speech, the patients at an early stage recognised that the defect lay with themselves; later they blamed other people for their difficulty, but as the psychosis developed, the defect became the source of delusional ideas. For example, one patient (Case 8, D.R.D.) said - "It all boils down to the fact that people I was talking to, started talking nonsense like babies. I thought I had driven them mad. Their talk was all jumbled up. I can will them to talk nonsense. I can control people through the ether and make them gibbering idiots who talk a lot of rubbish."

Finally, the disturbance in motility (dyspraxia) could also determine the content of delusions. For example, a patient (Case 10, A.McD.), who previously had some insight regarding his difficulty in moving, in the second year of his illness said - "They have been trying to put me off my feet; there is no doubt about it - it was my legs. I cannot make a movement anywhere unless it is with my legs. They can take away the power of my legs."

The conclusion suggested by this study is that delusions develop insidiously, and are preceded by a considerable period of time by profound disturbances in perception and cognition. In

these schizophrenic patients, the delusions did not appear suddenly 'out of the blue'. They appeared essentially to be attempts on the patient's part to explain, what was for them, a real experience. Thus these delusions could not be defined as 'primary' and the present clinical data is not in agreement with the view, which is still current, that disturbed perception is not involved in delusional development in schizophrenia. As isolated symptoms, these delusions probably do not have great diagnostic significance, and since they occur late, they are probably irrelevant for early diagnostic purposes. However, where diagnosis is in doubt, it is possible to use such ideas or delusions as clues to underlying perceptual disturbances which characterise the schizophrenic psychosis. It is not the presence of a paranoid idea or a delusion itself which is important, but rather how it has developed and what it means for the patient, which should be considered for diagnostic purposes.

IX. Cognitive Dysfunction and Catatonic Behaviour

Blocking phenomena characterised outwardly by a transient period of immobility, blank expression, and fixed gaze, occurred in the majority (95%) of patients. This phenomenon has already been discussed regarding its relation to a breakdown in perception and cognition (Section II).

Transient periods of mutism were encountered in the later stages of the illness in 16 out of 40 patients. However,

at an earlier stage some of these patients described that they often felt compelled to keep silent because of their difficulties in speech production. They described how they had a fear of saying wrong words or speaking incoherently to others. The voluntary nature of this symptom is illustrated in several of the reports dealing with difficulties in speech production (Cases 12, 19, 22, 23, 29, and 36). A few hebephrenic patients at a later stage, stated that they sometimes kept their hands in front of their mouth for the same reason, as one patient put it (Case 29) "to keep the words in".

Echolalia was very frequently observed in the majority of patients and is considered here to be secondary to the patient's difficulty in the perception of speech. Repetition of the other person's words appears to give the patient time to organise them into a meaningful pattern.

Echopraxia has already been discussed and is likewise interpreted as being due to the breakdown in the perception of the environment. Clinical observation suggests that echopraxia and pantomime are corresponding opposites, the former bearing the same relationship to impaired speech perception as the latter does to impaired speech production.

Some bizarre actions or postures were found to be the result of abnormal perception of memory images. For example, two patients (Cases 12 and 29), while conjuring up a memory image of Christ being crucified, stood still, with their arms out-stretched

sideways.

Some patients, also, gave an interesting account of why they carried out certain mannerisms and stereotypies. For example, one patient Case 22, C.G.) said - "Thoughts are still coming into my head that shouldn't come in. I frown or use my eyes just by blinking to get rid to these thoughts." A hebephrenic patient (Case 29, G.H.) often showed a stereotypy of rubbing his forehead and scalp. When asked why he did this, he said, "It seems to help. Massaging my head seems to help to clear my head." A catatonic patient(Case 12, F.A.K.) sometimes uttered isolated words, "to see if the words would go away". Another patient (Case 2, H.F.) with a stereotypy of his hands, said that he kept waving his hands, "to see if it would help to get the words I want to speak". Another patient (Case 14, R.McN.) shook his head rhythmically from side to side and explained that he did this to clear the confusion in his mind. The majority of patients were negativistic and explained their behaviour by saying that they were compelled to avoid people, especially in conversation, otherwise they would become mentally disturbed. Patients were noticed to become increasingly negativistic if the observer spoke too quickly, or if there happened to be a lot of extraneous stimulation.

The majority (three-quarters) of patients experienced from time to time a difficulty in the co-ordination of movement. Their movements were therefore slow, deliberate and restricted.

This loss of automation with regard to motor output has already been referred to and appears to be associated with the heightened consciousness of bodily processes.

More overt and more prolonged catatonic behaviour was exhibited by a proportion (16 out of 40) of patients who experienced a breakdown in visual perceptual constancy. These patients kept motionless for quite long periods, for several minutes at a time in the early stage, but, as the disease progressed, some did so for several hours at a time. The following reports relate to the subjective aspects of this behaviour.

Case 22 (C.G.) "Everything is all right when I stop! If I move everything I see keeps changing, everything I'm looking at gets broken up and I stop to put it together again."

Case 25 (J.O.McF.) "If I try to keep moving, and at the same time try to pay attention to what I see, that's when things become difficult. That's what happens in emergencies. I don't like it. I get into a panic. Normally it doesn't happen because I stop. I stop to get the depth of things, else I get the feeling I might walk into a wall. I have got to slow down to see. Stopping obviates the flatness. If you keep going the flatness tends to continue. I stop to obviate the flatness because I know if I continued, the flatness will develop. You only see a still picture if you don't move your head and eyes."

Case 12 (F.A.K.) "When I start walking I get a fast series of pictures in front of me. Everything seems to change and revolve around me. Something goes wrong with my eyes and I've got to stop and stand still."

Case 10(A.McD.) "I have got to control my movements in co-ordination with my mind. I have to slow up physically or else everything I look at comes at me all at once and overwhelms me."

Case 29 (G.H.) "It's as if you were seeing one picture one minute and another picture the next. I just stop and watch my feet. If I move, everything alters every minute and I have no control over my legs."

Case 32 (A.H.) "I am trying now to concentrate on the major issues, not tiny things. I have got to look for the important things in the picture in front of me instead at all the different bits. If you don't look just at the important things in the picture you get all fogged up. You cannot see things clearly. The picture gets blurred and you could trip over. You just stop. Moving on could be dangerous."

Finally, one or two patients explained that they controlled all their movements because, as many others had a fear of saying the wrong word when speaking, they had a fear of carrying out the wrong movement unless they controlled it consciously. This is illustrated in the following reports.

Case 25 (J.O.McF.) "I am afraid to move without giving all my attention to it, because if I am doing something else, I might carry out the wrong movement. For instance, on going out of that door, if I paid attention to something else, I might stand on my head. Wrong movements are inappropriate to the situation. The movement you made just now, doctor, is a good example. You moved your right hand with that pen in it. You put it to your face and the point was pointing out the way from your face, but it might just have easily turned the other way and jabbed you in the face." The above report illustrates how the patient utilises the observer as a model to which he may refer his own difficulties.

Case 10 (A.McD.) This report also contains an illustration of the projective interview technique described above. The patient in the second year of his illness was subject to standing still like a statue for minutes at a time. When asked directly why he did this, he was unable to explain, regardless of how often he was asked. He was then told, "Imagine you see a man standing still like a statue. He doesn't move. What reasons can you think of forthis behaviour?" The patient replied, "If anybody was standing like a statue he would be performing some mental test - that is definite. He would be trying to control his movement. He was not wanting anybody to know what he was doing. He would be thinking very hard about something. He would be trying to empty

his head of thoughts to enable him to stand still. If thoughts come through your head they are likely to be transmitted into action. Most of the things he might do would be involuntary. He could not be conscious of them. Since you think about every movement you have to make, it would take up too much time. It would get this way. He might become conscious of every movement or the majority of movements and if he has to think about them it would take up far too much time. When I am fully occupied, walking or talking or doing something, I can concentrate more easily. If I don't do this I get peculiar sensations. Peculiar feelings coming up my arms like a weakness. I should do something definite or active. If you don't it becomesunpleasant; tension mounts until you burst out in some way to relieve the tension. It has to do with what is going on around you. Things start to annoy you." This patient obviously had the fear that if an idea of movement came into his head, he may carry it out involuntarily.

It may be concluded that some forms of catatonic behaviour are emotionally determined and voluntarily initiated, at least in the early stages. If is probable that, left unchecked, such behaviour may become more persistent. It would appear that many catatonic symptoms may be more purposeful than appears superficially. It is also suggested that these symptoms are related to particular defects in perception and communication, rather than to any underlying psychogenic conflict. It may be possible to

classify such catatonic symptoms by reference to the particular perceptual or cognitive function which is disturbed. Finally, there does not appear to be any sharp division, with regard to these symptoms, between cases categorised as hebephrenic and catatonic, since this type of behaviour was observed in both of these classical subgroups. Of the sixteen patients who showed prolonged catatonic behaviour, seven (Cases 3, 12, 14, 25, 27, 35, 40) were diagnosed as catatonic, five (Cases 15, 21, 26, 29, 38) were placed in the hebephrenic subgroup, and four (Cases 9, 22, 24, 30) were difficult to classify. What these 16 patients had in common was not a tendency to behave in a catatonic fashion, but a gross disturbance in visual perception which appeared to be intricately connected with their motility. The other feature they had in common was a tendency for the illness to run a steady downhill course. These two features differentiated these patients from the rest of the group. It may be that the end clinical picture is determined, not so much by the basic disease process in malignant cases, but rather how the individual patient reacts to his deficiencies in perception and cognition and what methods of self-help he employs, some electing to maintain a restriction on all motor activity including speech, others deciding to relinquish such strategies at the price of performing in a disorganised fashion.

At any rate, it is apparent that individual emotional and psychogenic factors play some part in the development of the clinical picture, and that some catatonic types of behaviour and

habit deterioration may be checked by appropriate psychotherapeutic means. To be effective, the psychotherapy employed would have to take into consideration the patients' difficulties in perception and cognition. Such an approach has been outlined elsewhere (Chapman & McGhie, 1963).

DISCUSSION

The various phenomena which have been described have, to some extent, already been discussed. It remains to try and summarise these facets of schizophrenic experience and behaviour, and to discuss the significance of the clinical data as a whole.

With regard to symptoms with which the patient first presented, or which were first noticed by relatives, a list of some of these is given in Table 4 (Appendix D). It may be seen that these symptoms and complaints are similar to those described, in more detail, by Gillies (1958). It was found on enquiry, however, that, in individual patients, such complaints were multiple. Taking the group as a whole, every kind of neurotic symptom was encountered in the early stages of the disease. This of course is in agreement with many other clinical studies, some of which have been cited (p. 2). In particular, intense anxiety reactions were almost invariable, occurring more frequently that depression. However, when a comparison was made between individual cases, although a few isolated symptoms of the same kind tended to crop up in different patients, if all the patients'

symptoms were considered, then no common pattern emerged. One of the conclusions of the present study was that these presenting symptoms, spontaneously complained of by the patients, were superficial and had more to do with the individual patient's emotional reactions to his illness, rather than to the underlying disease process itself.

In contrast, when the patient's subjective experiences were examined in detail, a certain pattern did seem to emerge, although this was by no means uniform. The group of anomalies which were found, have been seen to refer to disturbances in attention, perception, memory, motility, thinking and speech. Although the reports of patients suggested that these disturbances did not occur evenly throughout the group, it was interesting that when any one of the phenomena did occur, it was experienced by different patients in a relatively stereotyped way. It is suggested, then, that the disturbances which have been described, have less to do with the patient's personality reactions, but are more basic to the schizophrenic process itself. Also, these various anomalies, taken together, resemble defects found in organic cerebral disease more closely than neurotic disorders. The clinical findings in the present study therefore support the view that schizophrenia is an organic illness, and it is possible that those previous studies which have concentrated on comparing the onset of schizophrenia with neuroses have been rather misleading.

It is not the purpose of the present study to make a detailed comparison between schizophrenia and organic diseases as a whole. However, it is of interest that there appears to be a close resemblance between some of the subjective experiences described by schizophrenic patients, and the ictal phenomena of temporal lobe epilepsy. However, as summarised in Table 3 (Appendix C), there also appear to be important differences, in respect of the degree of body image disturbance, ideokinetic dyspraxia, confusion of identity, echopraxia, attention disorder, and the degree of disordered visual perception. Although there is an overlap between temporal lobe and parietal lobe symptomatology, the symptoms which have just been mentioned are more typical of parietal lobe disorders (Critchley, 1953). Perhaps it should be mentioned at this point, that only one patient out of the 40 (Case 14, R.McN.) had a history of epileptic seizures, grand mal in type. In addition, those patients who reported the phenomenon most floridly, were subjected to electro-encephalographic (E.E.G.) examination, the records being within normal limits.

Concerning theoretical interpretation, the clinical data which has been presented above, endorse the hypothesis that, in schizophrenia, there is a disturbance in the selective and inhibitory functions of attention, which, in certain conditions, may be associated with an overloading of short-term memory with irrelevant sensory data. In other words, the alteration in

perceptual and cognitive processes, which manifests itself as a loss of automation and economy in mental function, together with a need for conscious voluntary control and co-ordination of sensory-motor activity, may place such a strain on the schizophrenic's immediate memory, that his performance of any mental task is very faulty and easily interfered with. Thus the schizophrenic's difficulties appear to become maximal when he actively engages in any sensory-motor activity, particularly if he tries to do several things at the one time. It seems that the patient will be much less disturbed if he restricts all forms of sensory-motor activity, and it may be inferred from many of the patients' statements that this is what they try to accomplish.

It may help to understand this concept of schizophrenic behaviour, if we refer to the many experimental studies of normal attentive and perceptual behaviour. Broadbent (1958, 1963), on the basis of a considerable body of evidence, draws the following conclusions, which accord well with those of Welford (1958), mentioned above (p. 90). The evidence suggests that the brain has a limit to its capacity for performing several tasks simultaneously. Broadbent postulates a single decision channel with a limited capacity for handling information, as it enters short-term memory storage. Information is held in short-term memory with a very limited time span, in the order of a few seconds. It is therefore impossible to attend to, and handle more than a critical amount of information in a given time. In order to

overcome the limitations inherent in this system, some 'filter' mechanism must operate on the intake of sensory data. Broadbent and his colleagues have demonstrated that the probability of any data being selected to pass through the filter depends on certain atrributes of the stimuli in question and upon the current state of the organism. This work has also shown that the limitation of the human communication channel is an informational one, so that the number of stimuli to which we can respond, at any one time, is determined by the amount of information they contain. It is thus possible to deal with more than one set of data at a time, only if the informational demands of each task are small. In order to function efficiently, the individual must be able to select and process information, in such a way as to avoid overloading his limited capacity to deal with it.

Modern evidence about immediate memory suggests that it is a separate process from the long-term sort (Broadbent, 1962). The evidence suggests a view of immediate memory as involving continuous action on the part of some mechanism, which is also needed for dealing with perception, and which cannot do both at once. Continuous tasks, which involve even a slight load on memory, are very vulnerable to distraction. The experimental investigations have shown that, when information is presented at a rate above the individual's maximum capacity for dealing with it, performance breaks down. Broadbent concludes that some of the results of experiments on short-term memory, emphasise the

importance of interference and of rehearsal as a possible means of combatting interference.

These concepts derived from experimental psychological research in normal subjects may be utilised in order to understand some aspects of schizophrenic behaviour. Schizophrenic patients appear to have a defect in some neurophysiological mechanism, which makes them unable to select, for retention in short-term memory, only information relevant to the task in hand. Their immediate memory appears vulnerable to intrusion by irrelevant information. They are therefore unable to perform several tasks, within the range of normal performance, and perceive accurately at the same time. As several patients reported in their own words, they - "cannot do two things at the one time". If they attempt to do so, then either perception becomes disturbed or else psychomotor performance is interfered with. It is therefore possible to see some rational purpose in the schizophrenic's attempts to restrict all sensory-motor activity. With regard to Broadbent's suggestion that rehearsal may be a means of combatting interference, it is interesting to view some forms of schizophrenic behaviour in this light. For example, echolalia, and the deliberate anticipation of motor acts with reference to a series of images of movement, could be regarded as forms of rehearsal, attempts to combat interference in their performance.

Returning to the clinical data, it may be concluded that the perceptual and cognitive changes described, contribute

considerably to the psychopathology of the illness. Specific anomalies, clearly may, in part, determine the nature and content of some symptoms. When a schizophrenic complains that the world around him has changed, in terms of his own experience, he may be stating a literal fact, and it is perhaps not suprising that he begins to ruminate and search for explanations to account for this change. Bizarre hypochondriacal ideas may likewise be derived from true disturbances in body image. Ideas that sex has changed, or fears of homosexuality are not necessarily derived from psychogenic conflict, but may develop as a result of abnormal perception of memory images of the opposite sex. If the observations made in this study are valid, then the schizophrenic is literally at the mercy of his environment. It is therefore understandable that the patient adopts a hostile attitude, and social withdrawal and negativism appear, at least in part, to be voluntarily initiated to protect himself from this environment. The most complex aspects of the schizophrenic's environment appear to be social ones. Other symptoms, mutism, some forms of catatonic immobility, have also been seen to relate to particular aspects of the breakdown in perceptual and cognitive function, as were, as the psychosis developed, delusions of all kinds, but particularly delusions of influence and delusions referring to communication.

Concerning impairment of speech in schizophrenia, the conclusions which are suggested by the present study are not in

accord with those expressed by Critchley (1964) in a brief discussion of psychotic speech. According to Critchley, in schizophrenia, there is no true inaccessibility of words; speech impairment in schizophrenia is a product of the patient's gradual withdrawal from the community; schizophrenics do not, like aphasic patients, while struggling to say a "yes", utter a "no", nor do they eke out their difficulties in speech by the use of gesture or pantomime; also, the schizophrenic is less aware and less emotionally disturbed by his deficiency in speech. Critchley infers from these various observations, that schizophrenic speech impairment is not aphasic.

The clinical data presented above conflicts with all of these points mentioned by Critchley. It appears that schizophrenic patients do have a true difficulty in word finding, although it tends to be episodic in occurrence, and very similar to the paroxysmal dysphasias which occur in temporal lobe epilepsy. Further, the difficulty in speech relates to both expressive and receptive aspects of communication. Rather than difficulty in speaking being a product of social withdrawal, the clinical data illustrates that schizophrenics tend to avoid other people because of their defective capacity in communicating. Also, schizophrenics particularly those with catatonic symptoms, were observed to give a negative reply, when they really wished to say "yes", and, with some embarrassment, correct themselves. These young schizophrenic patients were certainly aware of their defects in speech and in

the early stages, expressed appropriate emotional reactions about it. Finally, as has been mentioned above, the patients in the present study quite frequently resorted to gesture and pantomime to facilitate transmitting their ideas to others. It is suggested here then, that the disturbances, both in production and perception of speech in schizophrenia, indicate that a true aphasia is present. However, as in some other organic states, it tends to be paroxysmal in occurrence, and is not easily elicited unless specially looked for.

The present thesis has attempted to focus on diagnosis and does not purport to outline the natural history of schizophrenia. However, since the follow-up study extended in many cases to five years, it may be worth mentioning something of the outcome with regard to the presence of the various phenomena which have been described. The distribution of the phenomena in question, in relation to individual patients, is listed in Table 5 (Appendix E) with a rough indication as to course and outcome. The data suggests that gross disturbance in visual perception on the whole, is a bad prognostic symptom. The illness in patients who reported this symptom in the early stages, underwent a downhill course, the end clinical picture being that of hebephrenia or deteriorated catatonia. As noted earlier, catatonic symptoms occurred in both of these subgroups of schizophrenia. Those patients classified as catatonic appeared to be reacting to their disturbed visual perception mainly by voluntarily controlling and

restricting their own movements. Hebephrenic patients did the same, but more sporadically, and catatonic behaviour in their case was clouded over by a host of other positive symptoms, while in those classified as catatonic, such behaviour was the prominent feature, the other symptoms being largely negative. In general, if the patient experienced all of the phenomena which have been described, the course of the illness tended to be malignant. In particular, apart from visual perceptual changes, the subjective experience of echopraxia appeared to be a bad prognostic sign. Those patients who did not report experiencing the last two phenomena (disturbed visual perception and echopraxia) tended as a group to have more paranoid symptoms, and later in the illness, more persistent delusions, and their illness tended to run a more benign course.

With regard to early diagnosis, it is not suggested here that any one of the above phenomena, taken singly, is pathognomic of schizophrenia. With the possible exception of the complex blocking phenomenon, it is evident that these defects may occur in other organic states. As with other approaches to the clinical diagnosis of schizophrenia, it is still the overall picture which should be considered. The main difference between the present approach and previous ones dealing with early diagnosis, is that the pattern of symptoms considered important is organic in type. There is also more likelihood of agreement being obtained as to the operational definitions of the terms used in diagnosis. It

is true that the schizophrenic psychosis may be masked by multiple neurotic symptoms, but, there seems little doubt that schizophrenics experience the basic symptoms of the disease right from the outset.

However, as in many cases of cerebral disease, the above phenomena tend to be episodic and fleeting. They are seldom reported spontaneously by the patient, but must be looked for. These phenomena are very readily missed in single interviews or even in a series of interviews, unless the examination is orientated towards eliciting organic changes in mental function. The difficulty in assessing such symptoms at an early stage lies in the fact that they occur in the realm of subjective experience and are not noticeable outwardly. From this point of view, it may be said that the schizophrenic is his own best observer, and since in most cases the patient has repeatedly experienced some or all of these changes long before he attends for examination, it is important to tap this wealth of changed experience, utilising the patient's memory resources. This can be done more easily, the more intelligent the patient. In suspected cases where the diagnosis is in doubt, neurotic symptoms should perhaps be disregarded, and the patient should be asked specific questions regarding his attention, perception, motility, memory and expressive and receptive aspects of speech. Any complaint, no matter how vague, of his mind going 'blank', or being in a daze, trance etc., should be actively pursued, since further examination may reveal

the occurrence of blocking phenomena. Also, as mentioned above (p. 80), one of the earliest changes in schizophrenic experience, involves impairment in the process of empathy with other people. Here again, this change is subjectively experienced by the patient long before blunting of affect can be overtly noticed, and if asked, he may be able to report this symptom. If the patient has difficulty in the spontaneous description of his experiences, it may be useful to use the projective interview technique which has been described. Experience over the years has confirmed the usefulness of this measure. If such phenomena are elicited from young patients, the illness may then be differentiated from neurosis and affective and paranoid psychoses. Using this approach, the most likely sources of difficulty will occur with cases of temporal lobe epilepsy and cases of cerebral tumour or other brain damage, particularly of the parietal lobe, but these are conditions which can be eliminated by history-taking and other physical methods of examination.

The suggestion that the phenomena which have been described may be usefully applied to diagnosis, is strengthened by the fact that it is possible to test their validity by experimental means. The present author has been associated with a series of experimental studies concerning the effects of distraction on perception and immediate memory, on psychomotor performance, and on the perception of speech, in schizophrenic patients. This work has been reported elsewhere (McGhie, Chapman & Lawson, 1964, a, b, c).

The conclusion that schizophrenic patients have an inability to attend selectively to incoming information, has been reached independently by several groups of workers, utilising different means of investigation. The work of Weckowicz and his colleagues, who showed reduced visual perceptual constancy in schizophrenic patients, has already been mentioned (p.16). This defect was later shown to have a positive correlation with thought disorder (Weckowicz & Blewett, 1959). In the present study, the clinical findings suggested the presence of disturbed body image and self-identity in schizophrenia. Weckowicz & Sommer (1960) carried out several studies which showed that body image and self concept (self) were impaired in schizophrenic patients. These authors concluded, "There is a close relationship between the perception and knowledge of the external world, of one's body and of one's self. One influences the other, all three are affected in schizophrenia, probably by a disturbance of some underlying physiological mechanism." This group of workers, reviewing all the experimental findings, concluded that the abnormalities of thinking and perception, in schizophrenic patients, could be described as an inability to attend selectively or to select relevant information. Venables and his colleagues (1962, 1963), in a series of studies of the arousal level of schizophrenic patients, also concluded that many of their behavioural abnormalities were due to a defect in selective attention. Payne and his colleagues (1959, 1960, 1961, 1963), in an extensive series

of studies on psychotic thinking, showed that schizophrenics could be differentiated from other psychotic patients by the factor of 'overinclusion' in their thinking, and that this was dependent on a disorder of the attention processes. On the basis of many years of experimental investigations of schizophrenic patients, Shakow (1962) reached the following conclusion - "It is as if, in the scanning process which takes place before the response to a stimulus is made, the schizophrenic is unable to select out the material relevant for optimal response. He apparently cannot free himself from the irrelevant among the numerous possibilities available for choice. In other words, that function which is of equal importance as the response <u>to</u> stimuli, namely the protection <u>against</u> the response to stimuli, is abeyant... These irrelevant associations... would appear to arise from three sources: chance distractors from the environment; irrelevancies from the stimulus situation; and irrelevancies from past experience... The mere presence of these irrelevant factors seems to lead the schizophrenic to give them focal rather than group significance, signal rather than noise import."

It may be concluded, then, that much of the clinical data which has been presented in this thesis, correlates well with a considerable, steadily growing, body of experimental work in schizophrenia. The clinical approach which has been outlined, offers a tentative method which could possibly be developed for

the purposes of classifying schizophrenic illnesses in a new way. For example, the clinical data suggests that those patients who experience a disturbance in visual perception, may be separated out from the rest of the group. If such a clinical approach were combined with experimental psychological testing, it may be possible to introduce some scientific order into classification, by increasing the precision with which more homogeneous groups may be delineated, which is a prerequisite of biochemical and other physical investigations of schizophrenic psychoses.

SUMMARY

A detailed clinical study of changes in mental function, subjectively experienced by a group of 40 young schizophrenic patients, is reported. Various phenomena, related to disturbances in attention, perception, memory, motility, and speech, are described and discussed, with special reference to early diagnosis. It is suggested that these phenomena may be subjectively experienced by the patients long before signs of established disease appear overtly. It is argued that the clinical data presented support the view that schizophrenia is an organic psychosis, and, also, that the impairment in speech in this disease is aphasic in nature. The various anomalies described are interpreted in terms of a breakdown in the selective and inhibitory functions of attention, which may, in certain conditions, be associated with an overloading of short-term memory with irrelevant sensory data. The

experimental work in schizophrenia which supports this hypothesis is briefly mentioned, and the data is viewed against a background of experimental psychological research findings in normal subjects. It is suggested that the alteration in the perceptual and psychomotor functions in schizophrenia, results in a flooding of consciousness with redundant information, to a degree which is far beyond the limits of normal experience. Blocking phenomena are regarded as transient disturbances in consciousness produced by excessive stimulation from internal and external sources. A clinical comparison is made between the latter phenomenon, and epileptic disturbances of consciousness, the important differences being noted. Various emotional changes, catatonic symptoms and the development of delusions are discussed in relation to particular defects in perception and cognition. Finally, the tentative suggestion is made that the clinical approach outlined may be utilised, in conjunction with experimental psychological methods, for the purpose of classifying schizophrenic illnesses in a more specific manner.

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REFERENCES

AXEL, M. (1955) "Ten borderline cases: a report on the question of pseudoneurotic schizophrenia." Psychiat. Quart., 29, 555-587.

BALDWIN, J. M. (1895) Mental Development in the Child and in the Race. New York: Macmillan.

——— (1897) Social and Ethical Interpretations in Mental Development. New York: Macmillan.

BELLAK, L. (1958) Schizophrenia: A Review of the Syndrome. New York: Logos Press.

BLEULER, E. (1911) Dementia Praecox or the Group of Schizophrenias. New York: Int. Univ. Press, 1950.

BOTEZ, M. I. (1961) "Mild forms of aphasia, apraxia and agnosia." Acta neurol. scand., 37, 111-128.

BRAIN, R. (1961a) "The neurology of language." Brain, 84, 145-165.

——— (1961b) Speech Disorders. London: Butterworths.

——— (1963) "Some reflections on brain and mind." Brain, 86, 399.

BROADBENT, D. E. (1958) Perception and Communication. London: Pergamon Press.

——— and HERON, A. (1962) "Effects of a subsidiary task on performance involving immediate memory by younger and older men." Brit. J. Psychol., 53, 189-198.

CAMERON, N. (1938) "Reasoning, regression and communication in schizophrenics." Psychol. Monogr., 50, 1-33.

——— (1939) "Deterioration and regression in schizophrenic thinking." J. abnorm. soc. Psychol., 34, 265-270.

CHAPMAN, J., FREEMAN, T. and McGHIE, A. (1959) "Clinical research in schizophrenia - the psychotherapeutic approach." Brit. J. med. Psychol., 32, 75-85.

——— and McGHIE, A. (1962) "A comparative study of disordered attention in schizophrenia." J. ment. Sci., 108, 487-500.

CHAPMAN, J. and McGHIE, A. (1963) "An approach to the psychotherapy of cognitive dysfunction in schizophrenia." Brit. J. med. Psychol., 36, 253-260.

——— and McGHIE, A. (1964) "Echopraxia in schizophrenia." Brit. J. Psychiat., 110, 365-374.

CRITCHLEY, M. (1939) The Language of Gesture. London: Arnold.

——— (1953) The Parietal Lobes. London: Arnold.

——— (1964) "The neurology of psychotic speech." Brit. J. Psychiat., 110, 353-364.

CROOKES, T. G. (1957) "Size constancy and literalness in Rorschach test." Brit. J. med. Psychol., 30, 99-106.

CURRAN, D. and PARTRIDGE, M. (1955) Psychological Medicine (4th Ed.) Edinburgh: Livingstone.

FENICHEL, O. (1946) The Psychoanalytic Theory of Neurosis. New York: Norton. 438.

FISH, F. J. (1962) Schizophrenia. Bristol: Wright.

FOKER, B. R. (1950) "The latency of latent schizophrenia." J. Project. Tech., 14, 297.

GILLIES, H. (1949) "The schizophrenic disorders", in Modern Practice in Psychological Medicine (ed. Rees). London:Butterworth. 296-315.

——— (1958) "The clinical diagnosis of early schizophrenia", in Topics in Psychiatry (ed. Rodger, Mowbray and Roy). London: Cassell. 47-56.

GOLDSTEIN, K. (1939) "The significance of special mental tests for diagnosis and prognosis in schizophrenia." Amer. J. Psychiat., 96, 575-588.

HAMILTON, V. (1963) "Size constancy and cue responsiveness in psychosis." Brit. J. Psychol., 54, 25-39.

HAY, C. (1955) "Command-automatism and echopraxia to the television." Amer. J. Psychiat., 112, 65.

HENDERSON, D. and GILLESPIE, R. D. (1950) A Textbook of Psychiatry (7th Ed.) London: Oxford Univ. Press.

HENDERSON, D. and GILLESPIE, R. D. (1962) A Textbook of Psychiatry. London: Oxford Univ. Press.

HOCH, P. and POLATIN, P. (1949) "Pseudoneurotic forms of schizophrenia." Psychiat. Quart., 23, 248-276.

JACKSON, J. H. (1958) Selected Writings. (ed. Taylor). London: Staples Press.

KARAGULLA, S. and ROBERTSON, E. E. (1955) "Psychical phenomena in temporal lobe epilepsy and the psychoses." Brit. med. J., 1, 740.

KIESLER, F. (1952) "Masked schizophrenia." Bull. Univ. Minn. Hosp. Med. Found., 24, 211.

KLEIN, R. and MAYER-GROSS, W. (1957) The Clinical Examination of Patients with Organic Cerebral Disease. London: Cassell.

KNIGHT, R. P. (1953) "Borderline states." Bull. Menninger. Clin., 17, 1-12.

KRAEPELIN, E. (1919) "Dementia praecox.", from Textbook of Psychiatry (8th Ed.) (ed. Robertson). Edinburgh: Livingstone.

KUBIE, L. F. (1954) "Psychiatric and psychoanalytic considerations of the problem of consciousness", in Brain Mechanisms and Consciousness. (ed. Delafresnaye). Oxford: Blackwell Scientific Publications.

LAWSON, J. S., McGHIE, A. and CHAPMAN, J. (1964) "Perception of speech in schizophrenia." Brit. J. Psychiat., 110, 375-380.

LEONARD, J. A. (1953) (cited by Welford, 1958) "Advance information in sensori-motor skills." Quart. J. exp. Psychol., 141, 9.

LENNOX, W. G. (1960) Epilepsy and Related Disorders. London: Churchill.

LEWIS, A. J. (1950) In: A Textbook of the Practice of Medicine. (8th Ed.) (ed. Price). London: Oxford. Univ. Press.

McGHIE, A. and CHAPMAN, J. (1961) "Disorders of attention and perception in early schizophrenia." Brit. J. med. Psychol., 34, 103-116.

———; ———, and LAWSON, J. S. (1964a) "The effect of distraction on schizophrenic performance - (1) Perception and immediate memory." Brit. J. Psychiat. (In press.)

———, ———, ———. (1964b) "The effect of distraction on schizophrenic performance - (2) Psychomotor ability." Brit. J. Psychiat. (In press.)

———, ———, ———. (1964c) "Disturbances in selective attention in schizophrenia." Proc. Roy. Soc. Med., 57, 5, 419-422.

MARCHAND, L. and DE AJURIAGUERRA, J. (1948) Epilepsies: Leur Formes Cliniques. Leur Traitments. Paris: Desclee de Brouwer et Cie.

MAYER, W. (1950) "Remarks on abortive cases of schizophrenia." (abstract) J. nerv. ment. Dis., 112, 539.

MAYER-GROSS, W., SLATER, E. and ROTH, M. (1960) Clinical Psychiatry (2nd Ed.) London: Cassell.

MILLER, G. A. and SELFRIDGE, J. A. (1950) "Verbal context and the recall of meaningful material." Amer. J. Psychol., 63, 176-185.

PAYNE, R. W. (1961) "Cognitive abnormalities." in Handbook of Abnormal Psychology. (ed. Eysenck). New York: Basic Books Inc.

——— and HEWLETT, J. H. G. (1960) "Thought disorder in psychotic patients." in Experiments in Personality, Vol. II. (ed. Eysenck). London:Routledge & Kegan Paul.

———, MATUSSEK, P. and GEORGE, E. I. (1959) "An experimental study of schizophrenic thought disorder." J. ment. Sci., 105, 627-652.

———, ANCEVICH, S. S., and LAVERTY, S. G. (1963) "Overinclusive thinking in symptom-free schizophrenia." Canad. psychiat. Ass. J., 8, 225-234.

PENFIELD, W. and JASPER, H. (1954) Epilepsy and the Functional Anatomy of the Human Brain. London: Churchill.

PETERSON, D. R. (1954) "The diagnosis of subclinical schizophrenia." J. cons. Psychol., 18, 198.

PIAGET, J. (1951) Play, Dreams and Imitation in Childhood. London: Heinemann.

RAVEN, J. C. (1950) (cited by Timbury and Mowbray, 1964) "The comparative assessment of personality." Brit. J. Psychol., 40, 115-123.

SARBIN, T. R. (1954) "Role theory", in Handbook of Social Psychology. Cambridge, Mass: Addison-Wesley, 230-232.

————and HARDYCK, C. (1952) (cited by Sarbin, 1954) "Contributions to role-taking theory: role-perception on the basis of postural cues." (Unpublished manuscript).

SERAFETINIDES, E. A. and FALCONER, M. A. (1963) "Speech disturbances in temporal lobe seizures; a study in 100 epileptic patients submitted to anterior temporal lobectomy." Brain, 86, 333-346.

SHAKOW, D. (1962) "Segmental set: A theory of the formal psychological deficit in schizophrenia." Arch. gen. Psychiat., 6, 1-17.

SHENKEN, L. (1956) "Borderline states." J. nerv. ment. Dis., 123, 466-472.

SHERWOOD, S. L. (1957) "Consciousness, adaptive behaviour and schizophrenia", in Schizophrenia: Somatic Aspects. (ed. Richter). London: Pergamon Press. 131-145.

SKOTTOWE, I. (1953) Clinical Psychiatry for Practitioners and Students. London: Eyre and Spottiswoode.

SLATER, E., BEARD, A. W. and GLITHERO, E. (1963) "The schizophrenia-like psychoses of epilepsy." Brit. J. Psychiat., 109, 95-150.

STENGEL, E. (1947) "A clinical and psychological study of echo reactions." J. ment. Sci., 93, 598-612.

TIMBURY, G. C. and MOWBRAY, R. M. (1964) "The diagnosis of schizophrenia by Scottish psychiatrists." Brit. J. Psychiat., 110, 174-180.

VALENTINE, M. (1955) An Introduction to Psychiatry. Edinburgh: Livingstone.

VENABLES, P. H. (1963) "Selectivity of attention, withdrawal, and cortical activation." Arch. gen. Psychiat., 9, 74-78.

——— and WING, J. K. (1962) "Level of arousal and the sub-classification of schizophrenia." Arch. gen. Psychiat. 7, 114-119.

WECKOWICZ, T. E. (1957) "Size constancy in schizophrenic patients." J. ment. Sci., 103, 475-486.

——— and BLEWETT, D. B. (1959) "Size constancy and abstract thinking in schizophrenic patients." J. ment. Sci., 105, 909-934.

——— and SOMMER, R. (1960) "Body image and self-concept in schizophrenia." J. ment. Sci., 106, 17-39.

———, ———, and HALL, R. (1958) "Distance constancy in schizophrenic patients." J. ment. Sci., 104, 1174-1182.

——— (1964) "Shape constancy in schizophrenic patients." J. abnorm. soc. Psychol., 68, 177-183.

WELFORD, A. T. (1958) Ageing and Human Skill. London: Oxford Univ. Press.

WOLBERG, A. R. (1952) "The "borderline" patient." Amer. J. Psychother., 6, 694-710.

ZILBOORG, G. (1956) "The problem of ambulatory schizophrenias" Amer. J. Psychiat., 113, 519-525.

APPENDIX A

TABLE 1

DETAILS OF SCHIZOPHRENIC PATIENTS

Case No.	Initials	Age	Sex	Marital Status	Occupation	Duration of Illness in Months
1	D.G.S.	31	M	S	Labourer	1
2	H.F.	25	M	S	Labourer	2
3	T.McL.	30	M	S	French Polisher	2
4	A.F.	32	M	M	Electroplater	2
5	T.C.J.	28	M	S	Music Teacher	3
6	G.S.	27	M	M	Labourer	3
7	T.S.	31	M	S	Labourer	3
8	D.R.D.	22	M	S	Meteorologist	3
9	J.D.	20	M	S	Bank Clerk	3
10	A.McD.	31	M	S	Bricklayer	3
11	G.C.	22	M	S	Marine Engineer	3
12	F.A.K.	20	M	S	Apprentice Turner	4
13	C.M.	22	M	S	Student (Technical)	5
14	R.McN.	30	M	S	Plumber	6
15	J.H.	20	M	S	Student (Arts)	6
16	I.S.	17	M	S	Schoolboy	6
17	J.O.M.	23	M	M	Labourer	6
18	S.D.	32	F	M	Housewife	6
19	C.McD.	18	M	S	Apprentice Jeweller	6
20	W.M.	22	M	S	Storekeeper	6
21	J.Y.	26	M	S	Student (Arts)	8
22	C.G.	27	M	S	Clerk	9
23	S.G.	25	M	S	Technical Clerk	12
24	W.R.	30	M	S	Electrician's Mate	12
25	J.O.McF.	24	M	S	Apprentice Chartered Accountant	12
26	G.S.C.	25	M	S	Farm Worker	12
27	R.W.	29	M	S	Production Clerk	12
28	T.McD.	21	M	S	Labourer	14
29	G.H.	21	M	S	Apprentice Slater	16
30	A.McG.	20	M	S	Apprentice Surveyor	18
31	J.R.	22	M	S	Sawmill Worker	18
32	A.H.	20	M	S	Student of Art	18
33	J.E.M.	22	M	S	Student (Arts)	19
34	G.R.	22	M	S	Jute Worker	24
35	A.A.	23	M	S	Labourer	24
36	J.McD.	28	M	M	Jute Worker	24
37	J.A.McF.	28	M	S	Labourer	24
38	K.M.	19	F	S	Clerkess	24
39	A.J.T.	17	M	S	Schoolboy	28
40	J.W.	31	M	M	Laboratory Assistant	33

APPENDIX B - TABLE 2 - DETAILS OF EPILEPTIC PATIENTS

Case No.	Initials	Age	Sex	Marital Status	Occupation	Handedness	Duration of Seizures	Type of Seizure	Site of E.E.G. Focus
1	E.L.	51	F	S	Clerkess	Right	40 years	Psychomotor Petit Mal	Left fronto-temporal
2	A.M.	27	M	S	Apprentice Watchmaker	Right	4 years	Psychomotor	Right Anterior Temporal
3	G.P.	43	M	S	Shop Assistant	Right	27 years	Psychomotor Petit Mal	Left fronto-temporal
4	J.C.	21	M	S	Engineer	Right	1 year	Psychomotor	Bilateral temporal
5	M.R.	43	F	S	Farm worker	Right	38 years	Psychomotor	Left fronto-temporal
6	I.S.	23	M	S	Unemployed	Right	9 years	Psychomotor Petit Mal	Bilateral temporal
7	I.C.	23	M	S	Sheltered Workshop	Left	18 years	Psychomotor Petit Mal Grand Mal	Left temporal
8	J.O.C.	28	M	S	Sheltered Workshop	Right	19 years	Psychomotor Petit Mal	Right temporal
9	D.B.	25	M	S	Unemployed	Right	16 years	Psychomotor Grand Mal	Left temporal

APPENDIX C - TABLE 3

CLINICAL COMPARISON BETWEEN SCHIZOPHRENIC AND EPILEPTIC DISTURBANCES OF CONSCIOUSNESS

Clinical Feature	Petit Mal (PM)	Grand Mal (GM)	Psychomotor (PS)	Schizophrenia
1. Mode of onset	Abrupt	Abrupt	Gradual	Gradual
2. Precipitation by sensory stimuli	Rare	Infrequent	Infrequent	Very Frequent
3. Approximate duration of attack	Brief: 2-30 secs.	Longer than PM. ½-30 mins.	Intermediate: ½-2 mins.	Intermediate: 10 secs-2 mins.
4. Phenomena experienced subjectively during development of an attack:				
Aura	Rare	Frequent	Frequent	Absent
Disturbance of body image	Absent	Absent	Infrequent and mild	Present and severe
Ideokinetic dyspraxia	Absent	Absent	Absent	Present
Echopractic impulses	Absent	Absent	Absent	Present
Inability to screen out irrelevant stimuli	Absent	Absent	Slight	Severe
Effect of distraction on short-term memory	None	None	Mild	Severe
Disturbance of visual perception	Absent (rapid shut down)	Absent (rapid shut down)	Mild (Metamorphopsia)	Severe and generalised
Impairment of identity	Absent	Absent	Mild (Detachment from self)	Severe. Confusion of identity
Hallucinations	Absent	Absent	Frequent	Absent
Acute anxiety at onset	Absent	Absent	Frequent	Very frequent
Dysphasia	Absent	Absent	Frequent	Present
Intrusion or crowding of thoughts	Absent	Absent	Mild	Severe
Déjà vu	Absent	Absent	Frequent	Frequent
5. Observable changes during attack:				
Fixed gaze and blank expression	Present	Absent	Frequent	Present
Immobility	Present	Absent	Frequent	Present
Incoherence of speech	Absent	Absent	Frequent	Present
Falling with convulsions	Absent	Present	Absent	Absent
Incontinence	Rare	Present	Infrequent	Absent
Self-injury	Absent	Frequent	Absent	Absent
6. Disturbance of consciousness	Brief loss	More prolonged loss	Severe clouding which may be slow to clear	Brief, mild clouding which clears rapidly
7. Amnesia	Complete	Complete	Incomplete: Recall of early part of attack	Minimal: Recall of greater part of attack
8. Cessation of attack	Abrupt	Gradual	Gradual	Abrupt
9. Physical symptoms following attack	Rare	Frequent (Headache etc.)	Rare	Absent

APPENDIX D - TABLE 4 - PRESENTING COMPLAINTS

Case No.	Initials	1	2	3
1	D.G.S.	Change in experience of self	Confusion of thought	Withdrawal
2	H.F.	Concern with condition of feet	Loss of interest	Preoccupation with bodily functions
3	T.McL.	Aggressive behaviour	Lassitude	Persecutory ideas
4	A.F.	Anxiety	Grandiose preoccupation	Ideas of reference
5	T.C.J.	Anxiety	Loss of concentration	Persecutory ideas
6	G.S.	Marital problems	Suicidal ideas	Persecutory ideas
7	T.S.	Ruminating about life	Withdrawal	Persecutory ideas
8	D.R.D.	Religiosity	Loss of efficiency	Unable to concentrate
9	J.D.	Restlessness	Preoccupied with bodily functions	Seclusiveness
10	A.McD.	Loss of concentration	Withdrawal	Religiosity
11	G.C.	Backache	Religiosity	Ideas of reference
12	F.A.K.	Concern about facial appearance	Aggressive behaviour	Ideas of reference
13	C.M.	Anxiety	Hypochondriacal ideas	Suicidal ideas
14	R.McN.	Sensations in chest and abdomen	Irritability	Lassitude
15	J.H.	Philosophical ruminations	Fear of homosexuality	Lack of feeling for relatives
16	I.S.	Truancy from school	Religiosity	Depression
17	J.O.M.	Inability to mix with others	Ideas of reference	Persecutory ideas
18	S.D.	Lack of interest	Attacks of limpness, trembling and staggering	Ideas of reference
19	C.McD.	Hypochondriacal ideas concerning nose	Self-consciousness about speech	Feeling of deadness
20	W.M.	Anxiety	Poor concentration	Perplexity
21	J.Y.	Moodiness	Solitariness	Religious preoccupations
22	C.G.	Hypochondriacal preoccupations	Obsessional ideas	Ideas of reference
23	S.G.	Self-conscious of appearance of nose	Inability to enjoy anything	Ideas of reference
24	W.R.	Anxiety	Dysphagia	Inability to concentrate
25	J.O.McF.	Loss of efficiency	Loss of interest	Lassitude
26	G.S.C.	Headache	Poor memory	Fear of mixing with others
27	R.W.	Self-consciousness	Listlessness	Depression
28	T.McD.	Feeling body is changed	Ideas of reference	Withdrawal
29	G.H.	Hypochondriacal preoccupations	Moodiness	Solitariness
30	A.McG.	Loss of feeling	Poor concentration	Moodiness
31	J.R.	Poor sleep	Sexual preoccupations	Ideas of reference
32	A.H.	Feeling separate from others	Fear of insanity	Unreality feelings
33	J.E.M.	Feeling of inadequacy	Fear of homosexuality	Confusion of thoughts
34	G.R.	Self-consciousness	Moodiness	Seclusiveness
35	A.A.	Day-dreaming	Loss of efficiency at work	Withdrawal
36	J.McD.	Self-consciousness	Inability to mix in company	Numb feeling in face
37	J.A.McF.	Aggressive impulses	Anxiety	Persecutory ideas
38	K.M.	Various somatic complaints	Loss of concentration	Day-dreaming
39	A.J.T.	Infatuation with stranger	Moodiness	Ideas of reference
40	J.W.	Loss of concentration	Day-dreaming	Inability to think

APPENDIX E - TABLE 5

DISTRIBUTION OF PHENOMENA REPORTED AND OUTCOME

Case No.	Initials	I	II	III	IV	V	VI	VII	Course and Outcome
1	D.G.S.	-	+	+	+	+	-	-	C
2	H.F.	-	+	+	+	-	+	-	B
3	T.McL.	+	+	+	+	-	+	+	C
4	A.F.	-	+	-	-	-	+	-	B
5	T.C.J.	-	+	-	+	-	-	-	B
6	G.S.	-	+	+	+	-	-	-	B
7	T.S.	-	-	-	+	+	+	+	C
8	D.R.D.	-	+	+	+	-	-	+	A
9	J.D.	+	+	+	+	+	+	+	C
10	A.McD.	-	+	+	+	+	+	+	A
11	G.C.	-	+	-	-	-	-	-	B
12	F.A.K.	+	+	+	+	+	+	+	C
13	C.M.	-	+	-	+	-	-	+	B
14	R.McN.	+	+	+	+	+	+	+	D
15	J.H.	+	+	+	+	+	+	+	C
16	I.S.	-	+	+	+	-	-	+	A
17	J.O.M.	-	+	+	+	-	-	+	C
18	S.D.	-	+	-	-	-	-	-	A
19	C.McD.	-	+	+	+	+	+	+	B
20	W.M.	-	+	+	+	-	+	+	A
21	J.Y.	+	+	+	+	-	+	+	C
22	C.G.	+	+	+	+	+	+	+	B
23	S.G.	-	+	+	+	-	-	+	C
24	W.R.	+	+	-	-	-	-	+	C
25	J.O.McF.	+	+	-	-	-	+	+	B
26	G.S.C.	+	-	+	-	-	+	-	C
27	R.W.	+	+	+	+	-	-	+	A
28	T.McD.	-	+	+	+	-	-	+	B
29	G.H.	+	+	+	+	+	+	+	D
30	A.McG.	+	+	+	+	-	-	+	B
31	J.R.	-	+	-	-	-	+	-	A
32	A.H.	-	+	+	+	+	+	+	C
33	J.E.M.	-	+	+	+	-	-	+	B
34	G.R.	-	+	+	+	-	-	+	B
35	A.A.	+	+	+	+	-	+	+	C
36	J.McD.	-	+	+	+	+	+	+	C
37	J.A.McF.	-	+	-	-	-	-	-	B
38	K.M.	+	+	+	+	+	+	+	D
39	A.J.T.	-	+	+	+	-	-	-	B
40	J.W.	+	+	+	+	-	+	+	D
%	Total	40%	95%	75%	80%	32.5%	55%	72.5%	

I - Disturbance in Visual Perception
II - Blocking Phenomena
III - Disturbances in Speech Production
IV - Disturbance in Perception of Speech
V - Echopraxia
VI - Gesture Language
VII - Disturbances in Motor Functions

A - Maintaining improvement after first episode
B - Frequent remissions and relapses
C - Insidious Deterioration
D - Dementia